

FINAL REPORT 2002-2006

MONTANA PRAIRIE RIPARIAN NATIVE SPECIES STUDY



ROBERT G. BRAMBLETT

JASON A. MULLEN

MELISSA A. JONES-WUELLNER

CHRISTOPHER S. GUY

ALEXANDER V. ZALE

MONTANA COOPERATIVE FISHERY RESEARCH UNIT

MONTANA STATE UNIVERSITY-BOZEMAN

BOZEMAN, MT 59717

*Abstract.*—This final report is in two chapters. Chapter One is the Prairie Riparian Native Species Study. We sampled 104 site for fish, amphibians, reptiles, birds, and mammals. A complete synthesis and interpretation of prairie fish data collected by Montana Fish, Wildlife, and Parks and the Montana Cooperative Fishery Research Unit will be the subject of the synthesis report to be submitted by December 31, 2007. Chapter Two is the Spatiotemporal Variation of Fish Assemblages in Montana Prairie Streams portion of the project. There is little information on the spatiotemporal variation of fish assemblages in Montana prairie streams. This information is important for managers to better understand the ecosystem they manage and to allow them to design more efficient sampling regimes. We used stratified random sampling to select five tributaries of the Yellowstone River from Forsyth to Glendive that represent a gradient of steam size as measured by watershed area. We sampled fishes from these five streams at nine or ten (dependent on access and permission) longitudinal sites per stream arrayed from the confluence to the headwaters during June 2005, July 2005, and June 2006. From the set of longitudinal sites, a lower, middle, and upper site were established as temporal sites on each stream and we sampled these temporal sites again during August 2005, October 2005, and April 2006. In general, species richness decreased from downstream to upstream sites, whether assessing all species or only main river guild species. Trends in temporal variation of species richness should become more apparent as more data is collected; however, it appears that increases in species richness at lower sites may be associated with high flow events or recruitment to the sampling gear or both. Future evaluations will focus on the spatiotemporal variation of species composition and its relationship to longitudinal position, season, watershed size, and habitat variables. A complete analysis of the spatial and temporal results will be the subject of Jason Mullen's these to be submitted by December 31, 2007

## **Chapter 1: Prairie Riparian Native Species Study**

### **Introduction**

An analysis of Montana Fish, Wildlife and Park's (MFWP) Montana River Information System database indicated that more than 18,000 miles of streams in the Montana database have not been surveyed. The overwhelming majority of these waters are small, warmwater prairie streams located in eastern Montana. Some of these streams may contain intact, diverse assemblages of native fishes. Similarly, data is scarce or non-existent for amphibians, reptiles, birds, and small

mammals in the riparian and upland areas adjacent to these prairie streams. The purpose of this study is to gain a greater understanding of the vertebrate fauna that occurs in prairie streams and associated habitats by performing a survey of fish, amphibians, reptiles, birds, and mammals. This information will enable resource managers to better understand and manage prairie ecosystems.

### Study Area and Methods

We sampled sites in the Northern Great Plains and Northern Glaciated Plains Ecoregions in the eastern two thirds of Montana, which include portions of the Missouri, Yellowstone, and Little Missouri river basins. A total of 104 sites were sampled for birds, reptiles, amphibians, and mammals (Table 1). Two of the 104 sites were not sampled for fishes because the stream was too deep to wade safely.

The sampling effort consisted of two phases:

1. Phase 1 (Bird surveys)—Birds were surveyed from late May through June, during the season when males were actively singing on their territories.
2. Phase 2 (Fish, reptile, amphibian, and small mammal surveys)—These taxa were surveyed during June through September at the same sites sampled during Phase 1.

To assess temporal variability in species assemblages a subset of five sites were sampled four times. Five of the sites sampled early in Phase 1 were resampled towards the end of Phase 1 sampling. These same five sites were then sampled for the other taxa early and late in Phase 2 sampling. Quantification of within-site temporal variability will allow comparison to between-site variability to ascertain the extent to which differences among sites are caused by time of sampling.

*Reptiles and amphibians.*—Visual encounter surveys (VES) were used to determine the relative abundances of amphibians and reptiles (Heyer et al. 1994). Two 300-m VES transects were surveyed along the stream banks (2 banks x 300 m), and three 140-m transects were surveyed perpendicular to the stream along the mammal traplines. We recorded incidental observations of reptiles and amphibians during all other site activities, including vocalizations of frogs and toads heard while camping near sampling sites.

*Fishes.*—Fishes were surveyed at each site by seining a 300-m reach of stream. All fishes captured were identified to species, and lengths of at least 20 randomly selected individuals were recorded for each species. Up to ten voucher specimens for each species were preserved, and voucher specimens were examined in the laboratory to verify field identification of species. Specimens of *Phoxinus* sp. were identified as northern redbelly dace or northern redbelly dace x finescale dace hybrids by examining pharyngeal teeth in the laboratory. Specimens of *Hybognathus* sp. were tentatively identified in the field; species determinations were later confirmed by examining voucher specimens in the laboratory.

*Birds.*—Three point-counts were conducted at each site using standard protocols (Ralph et al. 1995). One point-count was conducted at the center of the fish survey reach and the others were located 300 m straight-line-distance upstream and downstream from the center point within the riparian zone. Bird surveys were conducted between May 18 and July 1, 2004. Each point-count was conducted for 10 minutes, and all birds detected visually or aurally were recorded. General vegetation condition and structure were recorded at each point-count site. These measurements were modified from protocols established for forested areas (Hutto et al. 2001). Point-count protocols were consistent with state-wide bird monitoring protocols under development as part of the Montana Bird Conservation Plan to enable incorporation of our data into the state-wide database.

*Mammals.*—Three, 140-meter line transects, centered on each bird point-count site, and running perpendicular to the stream channel were established at each site. Paired snap-traps and Sherman live traps baited with peanut butter and oats were set along this transect, evenly spaced at every ten meters along each transect (16 sets/transect x 2 traps/set x 3 transects = 96 traps/site). Traps were set in the late afternoon or evening, and checked the following morning. Mammals captured were identified to species except for *Peromyscus* sp., which are difficult to distinguish in the field (Foresman 2001; John Carlson, Bureau of Land Management, personal communication), so the two Montana species (deer mouse and white-footed mouse) were grouped as *Peromyscus* sp.

*Collaboration with Montana Fish, Wildlife, and Parks.*—In 2003, 2004, 2005, and 2006 we conducted a fish identification workshop for MFWP field technicians at Montana State

University (MSU) and prepared taxonomic keys for study guides and field use. We also prepared a written fish and habitat sampling protocol and data sheets for MFWP. A field techniques workshop was conducted at the Charles M. Russell National Wildlife Refuge in April 2003. We demonstrated fish sampling, site layout, and habitat measurement techniques. Fish voucher specimen verification was conducted at MSU during 2003-2006 where we worked with several MFWP technicians. We have assembled a master fish database that includes all prairie fish collection records from the Montana Cooperative Fishery Research Unit (MTCRFU) during 1999-2004 as well as all of FWP's prairie fish collection records from 2003 and 2004. This database contains over 750 samples from Montana prairie streams. Bob Bramblett worked with FWP prairie stream survey personnel to ensure that records in the database are correct, and provided the database to FWP for their own analyses. Bob presented these data at the 2005 annual meeting of the Montana Chapter American Fisheries Society.

## Results and Discussion

**Overall sampling effort.**—We sampled for fish, amphibians, reptiles, birds, and small mammals at 104 sites on 104 different creeks. We also sampled 5 of these sites twice per year over 3 years, thus we sampled a total of 129 times. Two sites, Lodge Creek near Chinook and Canyon Creek near Billings were not sampled for fish because the water was too deep to wade.

**Fishes.**—The sampled creek had water present on 101 times and was dry on 26 occasions. Of the 100 sampling events with water present, the water was flowing on 21 occasions, had continuous water on 12 occasions, and was interrupted pools on 68 occasions. Fish were present at 93 of the 101 sampling occasions with water present (92%). A total of 48,356 individual fishes of 32 taxa were captured (Table 2). The majority of fish taxa and individuals captured were native to Montana. Twenty-three taxa and 43,942 individual fishes (91%) were native, and the remaining 8 species and 4,414 individual fishes were introduced species.

Fathead minnow (*Pimephales promelas*) were the most commonly occurring species; they were present at 75 of 93 sites (81%) that had fish present. The only other species present at more than 50% of sites was white sucker (*Catostomus commersoni*). In order of declining occurrence, lake chub (*Couesius plumbeus*), brook stickleback (*Culaea inconstans*), black bullhead (*Ameiurus melas*), plains minnow (*Hybognathus placitus*), brassy minnow (*H. hankinsoni*), common carp

(*Cyprinus carpio*), sand shiner (*Notropis ludibundus*), longnose dace (*Rhinichthys cataractae*), northern redbelly dace (*Phoxinus eos*), and green sunfish (*Lepomis cyanellus*) were present at 50 to 10% of sites with fish.

Fish species occurring at less than 10% of sites (in order of declining commonness) were northern redbelly dace x finescale dace hybrid (*P. eos* x *P. neogaeus*), flathead chub (*Platygobio gracilis*), plains killifish (*Fundulus zebrinus*), pearl dace (*Margariscus margarita*), yellow perch (*Perca flavescens*), northern pike (*Esox lucius*), Iowa darter (*Etheostoma exile*), channel catfish (*Ictalurus punctatus*), western silvery minnow (*H. argyritis*), longnose sucker (*Catostomus catostomus*), creek chub (*Semotilus atromaculatus*), river carpsucker, (*Carpoides carpio*), stonecat (*Noturus flavus*), mountain sucker, (*C. platyrhynchus*), mountain whitefish (*Prosopium williamsoni*), shorthead redhorse (*Moxostoma macrolepidotum*), rainbow trout (*Oncorhynchus mykiss*), and largemouth bass (*Micropterus salmoides*) were each present at fewer than 10% of sites with fish.

Fathead minnow were the most numerous, comprising 57% of the total catch of 48,356 individual fish. Lake chub, plains minnow, and white sucker comprised 7%, 6%, and 5% of the catch, respectively. Brook stickleback, common carp, brassy minnow, black bullhead, longnose dace, green sunfish, sand shiner, northern redbelly dace each comprised from 5 to 1% of the catch. Mountain sucker, pearl dace, creek chub, river carpsucker, flathead chub, northern pike, yellow perch, channel catfish, plains killifish, longnose sucker, hybrid dace, western silvery minnow, Iowa darter, stonecat, largemouth bass, mountain whitefish, shorthead redhorse, and rainbow trout each comprised less than 1% of the catch.

*Amphibians and reptiles.*—A total of four amphibian species and eight reptile species were observed during retile and amphibian surveys (Table 3). Northern leopard frog (*Rana pipiens*) was the most commonly occurring species; they were present at 38 of 104 sites (36%). Painted turtle (*Chrysemys picta*) was present at 17 sites (16%) and plains gartersnake (*Thamnophis radix*) was present at 12 sites (12%). Woodhouse's toad (*Bufo woodhousii*) were present at eight sites (8%), and eastern racer (*Coluber constrictor*) were present at seven sites (7%). Boreal chorus frog (*Pseudacris maculata*), western rattlesnake (*Crotalus viridis*), gophersnake (*Pituophis catenifer*), Great Plains toad (*B. cognatus*), terrestrial gartersnake (*Thamnophis elegans*), tiger salamander (*Ambystoma tigrinum*), and common sagebrush lizard (*Sceloporus*

*graciosus*) were each present at 3 or fewer sites ( $\leq 3\%$ ). An additional two species: snapping turtle (*Chelydra serpentina*), greater short-horned lizard (*Phrynosoma hernandesi*) were incidentally observed at sampling sites. Smooth greensnake (*Opheodrys vernalis*) was observed on Montana Highway 5 in Daniels County; this is the westernmost and highest elevational record for this species (Werner et al. 2004).

*Birds.*—A total of 7,501 individual birds of 120 species was observed during point-count surveys (Table 4). The most commonly observed species during point-counts was western meadowlark (*Sturnella neglecta*), which was present at 97% of point-counts. The six next most common species, respectively, were brown-headed cowbird (*Molothrus ater*), red-winged blackbird (*Agelaius phoeniceus*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), eastern kingbird (*Tyrannus tyrannus*), and horned lark (*Eremophia alpestris*); each of these species was present at more than 50% of sites. We observed an additional 18 bird species through incidental observations in the vicinity of the sampling sites.

*Mammals.*—A total of 1,178 individual mammals of 11 taxa was captured (Table 5). The catch was dominated by *Peromyscus* sp.; 97% of the mammals captured were *Peromyscus* sp. The other species captured were meadow vole (*Microtus pennsylvanicus*), northern grasshopper mouse (*Onychomys leucogaster*), house mouse (*Mus musculus*), western harvest mouse (*Reithrodontomys megalotis*), prairie vole (*Microtus ochrogaster*), Ord's kangaroo rat (*Dipodomys ordii*), olive-backed pocket mouse (*Perognathus fasciatus*), long-tailed vole (*Microtus longicaudus*), Richardson's ground squirrel, thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*).

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Table 1. Locations of sites sampled during 2002-2004.

Stream	HUC name	HUC	Latitude	Longitude
Assiniboine Creek	Middle Milk	10050004	48.47400	107.90672
Big Dry Creek	Big Dry	10040105	47.31179	106.75230
Big Porcupine Creek	Big Porcupine	10100002	46.70027	107.22292
Bitter Creek	Middle Powder	10090207	45.02004	105.86445
Black Coulee (Marias)	Marias	10030203	48.30418	110.57092
Blood Creek	Lower Musselshell	10040205	47.24937	107.98557
Boxelder Creek (Poplar)	Poplar	10060003	48.18998	105.29129
Brazil Creek	Lower Milk	10050012	48.17144	106.98584
Buggy Creek	Lower Milk	10050012	48.34953	106.78653
Cabin Creek (Little Missouri)	Boxelder (Little Missouri)	10110202	45.61097	104.65363
Calf Creek	Lower Musselshell	10040205	47.19313	107.92961
Cameron Creek	Upper Musselshell	10040201	46.48560	108.91454
Cherry Creek	Lower Yellowstone	10100004	46.91706	105.71146
Chip Creek	Bullwhacker-Dog	10040101	47.82532	109.77505
Chouteau Coulee	Battle	10050008	48.79350	109.26830
Cottonwood Coulee (Whitewater)	Whitewater	10050011	48.96259	107.88623
Cottonwood Creek (Big Muddy)	Big Muddy	10060006	48.50540	104.16729
Cottonwood Creek (Frenchman)	Frenchman	10050013	48.81332	107.29386
Cottonwood Creek (Marias)	Marias	10030203	48.36300	110.93110
Crooked Creek (Musselshell)	Lower Musselshell	10040205	47.46049	108.02138
Crow Creek (Powder)	Lower Powder	10090209	45.67925	105.12371
Crow Creek (Rock)	Rock	10050015	48.79660	107.04200
Currant Creek	Upper Musselshell	10040201	46.38418	108.67878
Deep Creek (Teton)	Teton	10030205	47.76947	112.20570
Dog Creek	Bullwhacker-Dog	10040101	47.61522	109.40504
Dry Creek (Little Missouri)	Beaver (Little Missouri)	10110204	47.13076	104.04966
Dry Fork Marias	Marias	10030203	48.27402	111.81467
Duck Creek (Big Sandy)	Big Sandy	10050005	48.26742	110.01395
Duck Creek (Redwater)	Redwater	10060002	47.61395	105.45451
Eagle Creek (Big Muddy)	Big Muddy	10060006	48.76402	105.17393
Eagle Creek (Bullwhacker-Dog)	Bullwhacker-Dog	10040101	47.94434	109.86244
Eagle Creek (Willow)	Willow	10030204	48.74636	111.22450
East Fork Battle Creek	Battle	10050008	48.93944	109.13684
East Fork Fox Creek	Lower Yellowstone	10100004	47.74186	104.63324
East Fork Little Porcupine Creek	Prairie Elk-Wolf	10060001	48.44991	106.06615
East Fork Little Powder	Little Powder	10090208	45.30600	105.13080
East Pryor Creek	Pryor	10070008	45.41136	108.31290

East Redwater Creek	Redwater	10060002	47.72350	104.88794
Elk Creek	Flatwillow	10040203	46.93479	108.40971
Flat Creek (Beaver)	Beaver (Milk)	10050014	48.01394	107.59245
Flat Creek (Judith)	Judith	10040103	47.32442	112.18970
Fly Creek	Upper Yellowstone-Pompeys Pillar	10070007	45.86492	107.95836
Fogarty Coulee	Peoples	10050009	48.21589	108.93571
Ford's Creek	Box Elder (Musselshell)	10040204	47.12950	108.78593
Foster Creek	Lower Tongue	10090102	45.99788	105.94720
Hay Coulee	Lodge	10050007	48.94680	109.55030
Lake Creek (Upper Missouri)	Upper Missouri-Dearborn	10030102	47.71262	111.54945
Little Cottonwood Creek	Middle Milk	10050004	48.62011	107.83021
Little Dry Creek	Little Dry	10040106	46.98908	106.78506
Little Pumpkin Creek	Lower Tongue	10090102	45.74459	105.84949
Little Sage Creek	Sage	10050006	48.77680	110.76670
Little Warm Creek	Beaver (Milk)	10050014	48.05405	108.13941
Lodge Grass Creek	Little Bighorn	10080016	45.11938	107.60682
Lost Creek (Pryor)	Pryor	10070008	45.36111	108.49698
McDonald Creek	Box Elder (Musselshell)	10040204	46.99587	108.23323
Muddy Creek (Teton)	Teton	10030205	47.96167	111.85911
Murray Coulee	Cottonwood	10050010	48.91497	108.59513
Ninemile Coulee	Upper Milk	10050002	48.84010	110.35310
North Fork Burns Creek	Lower Yellowstone	10100004	47.54340	104.59420
North Fork Willow Creek	Upper Little Missouri	10110201	45.15353	104.80814
North Sunday Creek	Lower Yellowstone-Sunday	10100001	46.46587	105.92130
North Willow Creek	Middle Musselshell	10040202	46.62520	108.31100
O'Brian Coulee	Sage	10050006	48.67951	110.53995
Owl Creek	Little Bighorn	10080016	45.19842	107.28841
Pine Creek	O'fallon	10100005	46.30564	104.55807
Pole Creek	Upper Musselshell	10040201	46.45596	108.77314
Police Creek	West Fork Poplar	10060004	48.67637	105.64001
Prairie Elk Creek	Prairie Elk-Wolf	10060001	47.96943	105.87891
Pryor Creek	Pryor	10070008	45.85675	108.28883
Rattlesnake Creek	Middle Musselshell	10040202	46.81504	107.70322
Rotten Grass Creek	Lower Bighorn	10080015	45.38559	107.65226
Sage Creek (Wild Horse Lake)	Wild Horse Lake	10050003	48.99156	110.18038
Sand Creek (Big Dry)	Big Dry	10040105	47.03011	107.21466
Sand Creek (Powder)	Mizpah	10090210	45.87426	105.54028
Sarpy Creek	Lower Yellowstone-Sunday	10100001	46.14383	107.11596
Sheep Creek (Powder)	Lower Powder	10090209	46.28903	105.18478
Shonkin Creek	Upper Missouri-Dearborn	10030102	47.77955	110.64707
Sixshooter Creek	Upper Yellowstone-Lake Basin	10070004	45.99837	109.30840
Snake Creek (Milk)	Middle Milk	10050004	48.46364	109.09866
Snow Coulee	Porcupine	10050016	48.55405	106.42932
South Cottonwood Creek	Upper Little Missouri	10110201	45.18847	104.51563
South Fork Lisk Creek	Redwater	10060002	47.68269	105.05495
South Sunday Creek	Lower Yellowstone-Sunday	10100001	46.55090	106.23050

Sprague Creek	Rosebud	10100003	45.98319	106.44157
Steves Fork	Big Dry	10040105	47.26906	107.19433
Telegraph Creek	Fort Peck Reservoir	10040104	47.76392	107.77710
Thompson Creek (Little Dry)	Little Dry	10040106	47.05622	106.41518
Thompson Creek (Little Missouri)	Upper Little Missouri	10110201	45.03481	104.66104
Timber Creek (Fort Peck)	Fort Peck Reservoir	10040104	47.30773	106.16118
Timber Creek (Powder)	Lower Powder	10090209	45.66512	105.02059
Trail Creek (Tongue)	Upper Tongue	10090101	45.04434	106.38361
Trail Creek (Willow)	Willow	10030204	48.72129	111.41132
Tule Creek	Prairie Elk-Wolf	10060001	48.26182	105.55363
Tullock Creek	Lower Bighorn	10080015	46.06337	107.37814
U All Creek	Little Dry	10040106	47.02156	106.27220
West Blacktail Creek	Big Porcupine	10100002	46.67350	107.36466
West Charlie Creek	Charlie-Little Muddy	10060005	48.01020	104.88100
Whitney Creek	O'fallon	10100005	46.67503	105.06558
Wildhorse Creek	Beaver (Milk)	10050014	48.15658	108.30348
Willow Creek (Musselshell)	Middle Musselshell	10040202	46.71700	108.89791
Wolf Creek (Judith)	Judith	10040103	47.48546	109.70162
Woody Island Coulee	Cottonwood	10050010	48.87202	108.15799

Table 2. Fishes captured during 2002-2004.

Stream	Date 2	Species	Total
Assiniboine Creek	9/28/2002	brassy minnow	26
		brook stickleback	1
		fathead minnow	271
		hybrid dace	1
		northern redbelly dace	2
		pearl dace	19
		Phoxinus sp.	34
		white sucker	28
Assiniboine Creek	7/13/2002	brassy minnow	17
		brook stickleback	1
		fathead minnow	199
		hybrid dace	3
		lake chub	15
		northern redbelly dace	1
		Phoxinus sp.	118
		white sucker	33
Assiniboine Creek	7/11/2003	brassy minnow	1
		brook stickleback	1
		fathead minnow	3
		hybrid dace	1
		northern redbelly dace	1
		pearl dace	77
		Phoxinus sp.	102
		white sucker	5
Assiniboine Creek	9/17/2003	brassy minnow	3
		brook stickleback	1
		fathead minnow	280
		hybrid dace	3
		northern redbelly dace	1
		pearl dace	7
		Phoxinus sp.	16
	7/12/2004	brook stickleback	20
		fathead minnow	12
		northern redbelly dace	2
		pearl dace	29
		white sucker	69

Assiniboine Creek	9/15/2004	brassy minnow	267
		brook stickleback	8
		fathead minnow	266
		hybrid dace	1
		northern redbelly dace	10
		pearl dace	130
		white sucker	136
Big Dry Creek	9/4/2002	black bullhead	146
		common carp	90
		fathead minnow	60
		lake chub	1
		plains killifish	1
		plains minnow	9
		sand shiner	1
		yellow perch	4
Big Porcupine Creek	7/21/2004	fathead minnow	20
Bitter Creek	9/17/2002	brassy minnow	36
		creek chub	44
		fathead minnow	40
		plains killifish	1
		sand shiner	55
		white sucker	4
Black Coulee (Marias)	8/24/2003	fathead minnow	1,600
Blood Creek	9/1/2002	no fish	
Boxelder Creek (Poplar)	7/23/2002	black bullhead	20
		northern pike	2
		white sucker	2
Brazil Creek	8/9/2004	fathead minnow	59
Buggy Creek	7/18/2002	fathead minnow	7
		lake chub	1
Cabin Creek (Little Missouri)	7/27/2003	black bullhead	112
		common carp	23
		green sunfish	42
		sand shiner	6

Calf Creek	8/6/2004	no fish	
Cameron Creek	8/5/2003	no fish	
Cherry Creek	8/13/2004	no fish	
Chip Creek	8/18/2003	no fish	
Chouteau Coulee	8/6/2002	no fish	
Cottonwood Coulee (Whitewater)	8/22/2003	no fish	
Cottonwood Creek (Big Muddy)	9/6/2003	brook stickleback	9
		fathead minnow	1,040
		white sucker	137
Cottonwood Creek (Frenchman)	8/21/2003	no fish	
Cottonwood Creek (Marias)	8/1/2002	common carp	367
Crooked Creek (Musselshell)	8/7/2004	channel catfish	2
		common carp	732
		lake chub	81
		plains minnow	176
		western silvery minnow	1
Crow Creek (Powder)	9/15/2002	brassy minnow	42
		common carp	16
		creek chub	1
		fathead minnow	62
		green sunfish	445
		plains minnow	2
		river carpsucker	1
		sand shiner	181
		white sucker	5
Crow Creek (Rock)	7/18/2002	black bullhead	3
		fathead minnow	113
		lake chub	23
		plains minnow	1
		white sucker	4

Crow Creek (Rock)	9/28/2002	black bullhead	107
		brassy minnow	83
		fathead minnow	101
		hybrid dace	1
		lake chub	188
		plains minnow	2
		white sucker	30
Crow Creek (Rock)	7/10/2003	brassy minnow	3
		fathead minnow	193
		lake chub	444
		plains minnow	243
		white sucker	18
Crow Creek (Rock)	9/18/2003	black bullhead	119
		brassy minnow	412
		fathead minnow	2,738
		Iowa darter	1
		lake chub	376
		plains minnow	310
		white sucker	165
Crow Creek (Rock)	7/12/2004	fathead minnow	29
		lake chub	2
		white sucker	1
Crow Creek (Rock)	9/16/2004	black bullhead	11
		brassy minnow	3
		fathead minnow	653
		lake chub	544
		plains minnow	32
		white sucker	93
Currant Creek	8/28/2002	no fish	
Deep Creek (Teton)	8/20/2004	brook stickleback	14
		fathead minnow	32
		lake chub	2
		white sucker	16

Dog Creek	7/12/2002	brassy minnow	1
		brook stickleback	1
		common carp	1
		fathead minnow	18
		lake chub	18
		longnose dace	5
		plains minnow	12
Dog Creek	9/30/2002	fathead minnow	74
		lake chub	44
		plains minnow	18
Dog Creek	7/14/2003	brook stickleback	3
		fathead minnow	49
		flathead chub	1
		lake chub	30
		white sucker	89
Dog Creek	9/19/2003	no fish	
Dog Creek	7/13/2004	brook stickleback	1
		fathead minnow	9
		lake chub	40
		plains minnow	4
		white sucker	81
Dog Creek	9/17/2004	brassy minnow	53
		brook stickleback	33
		common carp	1
		fathead minnow	305
		lake chub	303
		longnose dace	1
		plains minnow	5
		white sucker	67
Dry Creek (Little Missouri)	7/29/2003	black bullhead	2
		green sunfish	2
Dry Fork Marias	8/24/2004	brook stickleback	35
		fathead minnow	4
		flathead chub	3
		lake chub	66
		longnose dace	85
		white sucker	23
Duck Creek (Big Sandy)	8/24/2003	no fish	
Duck Creek (Redwater)	9/9/2003	no fish	



Eagle Creek (Big Muddy)	7/21/2002	brassy minnow	17
		brook stickleback	23
		fathead minnow	172
		Iowa darter	2
		pearl dace	61
		white sucker	84
Eagle Creek (Bullwhacker-Dog)	9/3/2004	brassy minnow	80
		fathead minnow	213
		lake chub	9
		longnose dace	107
		northern redbelly dace	250
		white sucker	446
Eagle Creek (Willow)	8/2/2002	fathead minnow	78
East Fork Battle Creek	9/4/2004	black bullhead	20
		brook stickleback	5
		fathead minnow	218
		northern pike	7
East Fork Fox Creek	9/5/2003	brook stickleback	19
		fathead minnow	4
East Fork Little Porcupine Creek	9/7/2003	brassy minnow	6
		brook stickleback	443
		fathead minnow	519
		hybrid dace	1
		lake chub	5
		northern redbelly dace	1
		Phoxinus sp.	64
		white sucker	44
East Fork Little Powder	9/16/2002	black bullhead	7
		creek chub	68
		fathead minnow	62
		longnose dace	68
		sand shiner	10
		stonecat	3
		white sucker	4

East Pryor Creek	7/27/2004	fathead minnow	1
		lake chub	3
		longnose dace	48
		mountain sucker	348
		white sucker	151
East Redwater Creek	8/11/2004	no fish	
Elk Creek	8/31/2002	common carp	2
Flat Creek (Beaver)	9/1/2002	black bullhead	287
		common carp	7
		fathead minnow	20
		lake chub	10
Flat Creek (Judith)	8/20/2004	lake chub	10
		longnose dace	24
		northern redbelly dace	1
		rainbow trout	1
		white sucker	10
Fly Creek	9/5/2002	common carp	4
Fogarty Coulee	8/19/2003	no fish	
Ford's Creek	9/2/2002	brassy minnow	10
		fathead minnow	904
		northern redbelly dace	4
		Phoxinus sp.	24
Foster Creek	9/15/2002	brassy minnow	64
		common carp	206
		fathead minnow	26
		green sunfish	86
		plains minnow	73
		sand shiner	99
		white sucker	2
Hay Coulee	8/5/2002	no fish	
Lake Creek (Upper Missouri)	8/25/2003	no fish	

Little Cottonwood Creek	7/12/2003	brassy minnow	8
		brook stickleback	34
		fathead minnow	315
		white sucker	5
Little Dry Creek	9/8/2004	brassy minnow	98
		common carp	2
		fathead minnow	1,765
		lake chub	267
		plains killifish	5
		sand shiner	50
		white sucker	45
		yellow perch	4
Little Pumpkin Creek	7/24/2003	lake chub	14
Little Sage Creek	8/3/2002	no fish	
Little Warm Creek	8/8/2004	no fish	
Lodge Grass Creek	7/25/2004	longnose dace	40
		longnose sucker	3
		mountain whitefish	3
		white sucker	3
Lost Creek (Pryor)	8/12/2003	no fish	
McDonald Creek	8/5/2004	no fish	
Muddy Creek (Teton)	7/31/2002	lake chub	5
		longnose dace	61
		sand shiner	29
		white sucker	12
Murray Coulee	8/7/2002	brook stickleback	4
		fathead minnow	3
Ninemile Coulee	8/4/2002	no fish	
North Fork Burns Creek	7/25/2002	green sunfish	1

North Fork Willow Creek	7/22/2003	black bullhead	5
		brassy minnow	19
		fathead minnow	107
		sand shiner	1
		white sucker	3
North Sunday Creek	9/4/2003	black bullhead	22
		channel catfish	19
		common carp	6
		fathead minnow	177
		flathead chub	26
		green sunfish	10
		longnose dace	14
		plains minnow	103
		river carpsucker	91
North Willow Creek	8/29/2002	no fish	
O'Brian Coulee	8/25/2004	no fish	
Owl Creek	8/11/2003	black bullhead	30
		fathead minnow	230
		lake chub	106
		longnose dace	1
		white sucker	4
Pine Creek	7/28/2003	brassy minnow	1
		brook stickleback	24
Pole Creek	7/14/2004	no fish	
Police Creek	7/20/2002	brook stickleback	19
		fathead minnow	8
Prairie Elk Creek	8/10/2004	black bullhead	1
		common carp	3
		fathead minnow	88
		flathead chub	4
		lake chub	7
		longnose dace	106
		longnose sucker	8
		plains minnow	120
		sand shiner	22
		white sucker	42
Pryor Creek	7/28/2004	channel catfish	1
		fathead minnow	17
		longnose dace	322

		white sucker	72
Rattlesnake Creek	9/9/2004	fathead minnow	749
		lake chub	53
		plains minnow	26
Rotten Grass Creek	7/26/2004	fathead minnow	83
		lake chub	2
		longnose dace	11
		white sucker	11
Sage Creek (Wild Horse Lake)	8/23/2003	no fish	
Sand Creek (Big Dry)	9/6/2004	common carp	52
		fathead minnow	660
Sand Creek (Powder)	7/24/2003	no fish	
Sarpy Creek	7/23/2004	black bullhead	14
		common carp	1
		fathead minnow	935
		green sunfish	408
		white sucker	10
Sheep Creek (Powder)	8/12/2004	black bullhead	3
		fathead minnow	710
		flathead chub	2
		green sunfish	1
		lake chub	3
		longnose dace	58
		plains minnow	183
		white sucker	8

Shonkin Creek	8/21/2004	fathead minnow	632
		flathead chub	4
		lake chub	260
		longnose dace	166
		longnose sucker	12
		mountain sucker	7
		sand shiner	7
		shorthead redhorse	1
		stonecat	1
		western silvery minnow	2
		white sucker	110
Sixshooter Creek	8/4/2003	no fish	
Snake Creek (Milk)	8/25/2004	brassy minnow	211
		brook stickleback	44
		fathead minnow	65
		hybrid dace	3
		Iowa darter	2
		northern redbelly dace	54
		white sucker	29
Snow Coulee	7/20/2002	northern pike	29
South Cottonwood Creek	7/26/2003	black bullhead	3
		common carp	22
		fathead minnow	325
		green sunfish	7
		plains minnow	63
		sand shiner	2
		white sucker	7
South Fork Lisk Creek	9/8/2003	no fish	
South Sunday Creek	9/4/2002	black bullhead	2
		channel catfish	7
		common carp	8
		fathead minnow	5
		flathead chub	53
		lake chub	2
		plains minnow	96
		river carpsucker	1
		sand shiner	7
		western silvery minnow	3
Sprague Creek	7/21/2003	no fish	
Steves Fork	7/6/2002	black bullhead	16

		brassy minnow	173
		common carp	117
		fathead minnow	1,736
		lake chub	43
		plains killifish	5
		plains minnow	45
		sand shiner	13
		yellow perch	1
Steves Fork	9/26/2002	black bullhead	132
		brassy minnow	85
		common carp	41
		fathead minnow	418
		lake chub	3
		plains minnow	53
		yellow perch	22
Steves Fork	7/10/2003	black bullhead	6
		brook stickleback	18
		common carp	1
		fathead minnow	109
		plains minnow	2
Steves Fork	9/16/2003	black bullhead	3
		brassy minnow	64
		common carp	11
		fathead minnow	417
		plains minnow	15
		sand shiner	2
Steves Fork	7/11/2004	brook stickleback	540
		fathead minnow	242
Steves Fork	9/14/2004	brook stickleback	539
		fathead minnow	487
		plains killifish	1
		plains minnow	3
Telegraph Creek	7/13/2003	fathead minnow	5

Thompson Creek (Little Dry)	7/11/2002	black bullhead	10
		brook stickleback	17
		fathead minnow	653
		lake chub	7
		plains minnow	14
		sand shiner	1
		white sucker	1
Thompson Creek (Little Dry)	9/26/2002	black bullhead	2
		brook stickleback	24
		common carp	28
		fathead minnow	238
		lake chub	2
		largemouth bass	3
		longnose dace	1
		plains minnow	279
		sand shiner	56
Thompson Creek (Little Dry)	7/9/2003	black bullhead	19
		brook stickleback	6
		fathead minnow	270
		lake chub	3
		plains minnow	469
		sand shiner	21
Thompson Creek (Little Dry)	9/15/2003	black bullhead	44
		brook stickleback	6
		fathead minnow	1095
		lake chub	3
		longnose dace	1
		sand shiner	7
		white sucker	9
Thompson Creek (Little Dry)	7/10/2004	black bullhead	10
		brook stickleback	22
		fathead minnow	1,110
		lake chub	2
		plains minnow	320
		white sucker	4



Thompson Creek (Little Dry)	9/13/2004	black bullhead	93
		brook stickleback	20
		common carp	108
		fathead minnow	983
		lake chub	1
		plains minnow	189
		sand shiner	6
		white sucker	6
Thompson Creek (Little Missouri)	7/24/2004	fathead minnow	11
Timber Creek (Fort Peck)	9/7/2004	brook stickleback	1
		plains killifish	6
Timber Creek (Powder)	7/25/2003	no fish	
Trail Creek (Tongue)	8/10/2003	no fish	
Trail Creek (Willow)	8/23/2004	brook stickleback	20
		fathead minnow	3
Tule Creek	7/22/2002	northern pike	4
Tullock Creek	8/9/2003	black bullhead	13
		common carp	13
		fathead minnow	373
		green sunfish	12
		plains killifish	5
		sand shiner	3
		white sucker	37
U All Creek	8/8/2003	no fish	
West Blacktail Creek	8/7/2003	black bullhead	97
		fathead minnow	14
		green sunfish	78
West Charlie Creek	7/24/2002	brook stickleback	10
		fathead minnow	2212
		Iowa darter	1
		plains minnow	1
		white sucker	84
Whitney Creek	7/29/2004	no fish	
Wildhorse Creek	8/20/2003	no fish	
Willow Creek (Musselshell)	8/6/2003	lake chub	35

		longnose dace	12
		white sucker	18
Wolf Creek (Judith)	7/15/2004	fathead minnow	10
		lake chub	486
		longnose dace	3
		northern redbelly dace	180
		white sucker	182
Woody Island Coulee	9/5/2004	brook stickleback	2
Grand Total			48,356

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Table 3. Amphibians and reptiles observed in 2002-2004.

Site	Date	Survey or incidental	Species	Total
Assiniboine Creek	5/31/2002	Incidental	painted turtle	1
Assiniboine Creek	7/13/2002	Survey	northern leopard frog	4
		Incidental	northern leopard frog	1
			painted turtle	1
Assiniboine Creek	9/27/2002	Survey	northern leopard frog	4
			painted turtle	1
			plains gartersnake	1
			terrestrial gartersnake	1
Assiniboine Creek	5/26/2003	Incidental	painted turtle	1
Assiniboine Creek	7/11/2003	Survey	northern leopard frog	1
		Incidental	northern leopard frog	2
			painted turtle	4
Assiniboine Creek	9/17/2003	Survey	northern leopard frog	5
Assiniboine Creek	7/12/2004	Survey	northern leopard frog	3
		Incidental	painted turtle	1
Assiniboine Creek	9/15/2004	Survey	northern leopard frog	39
		Incidental	northern leopard frog	1
			painted turtle	2
			plains gartersnake	1
Big Dry Creek	5/27/2002	Incidental	painted turtle	1
	9/3/2002	Survey	northern leopard frog	13
			Woodhouse's toad	1
		Incidental	northern leopard frog	1
			snapping turtle	1
			Woodhouse's toad	1
Big Porcupine Creek	7/21/2004	Survey	eastern racer	1
		Incidental	eastern racer	4
			plains gartersnake	1
Bitter Creek	6/22/2002	Incidental	northern leopard frog	1
			painted turtle	1
			Woodhouse's toad	1
Black Coulee (Marias)	8/24/2003	Survey	plains gartersnake	1

Blood Creek	9/1/2002	Survey	Great Plains toad	5
			Woodhouse's toad	24
		Incidental	Woodhouse's toad	1
Boxelder Creek	6/18/2002	Incidental	painted turtle	1
	7/23/2002	Incidental	northern leopard frog	1
Brady Road	5/5/2002	Incidental	gophersnake	1
Brazil Creek	8/9/2004	Survey	northern leopard frog	36
		Incidental	painted turtle	1
			plains gartersnake	1
Buggy Creek	7/18/2002	Survey	eastern racer	1
			painted turtle	1
Cabin Creek	7/27/2003	Survey	northern leopard frog	2
			plains gartersnake	1
		Incidental	northern leopard frog	1
Calf Creek	8/7/2004	Incidental	Woodhouse's toad	1
Chip Creek	5/27/2003	Incidental	boreal chorus frog	1
Content	5/30/2002	Incidental	eastern racer	1
Cottonwood Creek (Big Muddy)	9/6/2003	Survey	northern leopard frog	4
			painted turtle	1
Cottonwood Creek (Frenchman)	8/21/2003	Incidental	boreal chorus frog	2
Cottonwood Creek (Marias)	8/1/2002	Incidental	greater short-horned lizard	1
			western rattlesnake	1
Crooked Creek	8/7/2004	Survey	northern leopard frog	3
			Woodhouse's toad	1
		Incidental	northern leopard frog	1
Crow Creek (Powder)	9/15/2002	Survey	northern leopard frog	4
Crow Creek (Rock)	5/31/2002	Incidental	boreal chorus frog	1
Crow Creek (Rock)	6/24/2002	Incidental	boreal chorus frog	1
Crow Creek (Rock)	9/28/2002	Incidental	northern leopard frog	2
			plains gartersnake	1

Crow Creek (Rock)	5/24/2003	Incidental	boreal chorus frog	1
Crow Creek (Rock)	7/10/2003	Incidental	northern leopard frog	1
Crow Creek (Rock)	9/18/2003	Survey	northern leopard frog	1
		Incidental	boreal chorus frog	1
			northern leopard frog	1
			plains gartersnake	1
Crow Creek (Rock)	7/11/2004	Incidental	eastern racer	4
Crow Creek (Rock)	9/16/2004	Survey	northern leopard frog	23
			painted turtle	1
Currant Creek	6/24/2002	Incidental	boreal chorus frog	1
			common sagebrush lizard	1
			Great Plains toad	1
			plains spadefoot	1
			Woodhouse's toad	1
Currant Creek	8/28/2002	Survey	boreal chorus frog	29
			Great Plains toad	2
		Incidental	common sagebrush lizard	1
Dog Creek	5/29/2002	Incidental	boreal chorus frog	1
			Woodhouse's toad	1
Dog Creek	6/26/2002	Incidental	boreal chorus frog	1
Dog Creek	7/11/2002	Survey	western rattlesnake	1
		Incidental	northern leopard frog	5
Dog Creek	9/29/2002	Survey	northern leopard frog	8
Dog Creek	5/27/2003	Incidental	Woodhouse's toad	1
Dog Creek	6/26/2003	Incidental	western rattlesnake	1
Dog Creek	7/15/2003	Survey	plains gartersnake	1
		Incidental	eastern racer	2
			northern leopard frog	1
Dog Creek	7/13/2004	Survey	Woodhouse's toad	2
		Incidental	northern leopard frog	1
			plains gartersnake	1
Dog Creek	9/17/2004	Survey	northern leopard frog	10
		Incidental	western rattlesnake	1

Dry Creek	6/8/2003	Incidental	painted turtle	1
	7/29/2003	Survey	northern leopard frog	20
Dry Creek Road	5/30/2002	Incidental	eastern racer	1
Dry Fork Marias	8/24/2004	Survey	northern leopard frog	2
		Incidental	eastern racer	1
			northern leopard frog	5
			terrestrial gartersnake	1
Duck Creek (Redwater)	9/8/2003	Survey	painted turtle	1
Eagle Creek (Big Muddy)	6/19/2002	Incidental	painted turtle	1
Eagle Creek (Big Muddy)	7/21/2002	Survey	painted turtle	1
		Incidental	northern leopard frog	1
			plains gartersnake	1
Eagle Creek (Bullwhacker-Dog)	9/3/2004	Survey	northern leopard frog	10
		Incidental	northern leopard frog	2
			western rattlesnake	1
East Fork Fox Creek	9/4/2003	Incidental	northern leopard frog	50
			painted turtle	2
East Fork Little Porcupine	9/6/2003	Incidental	plains gartersnake	1
East Fork Little Powder	6/21/2002	Incidental	boreal chorus frog	1
			northern leopard frog	1
East Fork Little Powder	9/16/2002	Survey	northern leopard frog	33
East Pryor Creek	7/27/2004	Survey	eastern racer	2
			northern leopard frog	1
		Incidental	northern leopard frog	2
			western rattlesnake	1
East Redwater Creek	8/11/2004	Survey	painted turtle	1
Elk Creek	5/25/2002	Incidental	painted turtle	1
Elk Creek	8/30/2002	Survey	boreal chorus frog	1
		Incidental	greater short-horned lizard	1
			western rattlesnake	1
Flat Creek	5/30/2002	Incidental	painted turtle	1

Flat Creek	8/31/2002	Survey	northern leopard frog	1
Fly Creek	6/23/2002	Incidental	painted turtle	1
Fly Creek	9/5/2002	Survey	painted turtle	1
Fogarty Coulee	8/19/2003	Incidental	tiger salamander	1
Foster Creek	6/22/2002	Incidental	eastern racer snapping turtle	1 1
Foster Creek	9/14/2002	Incidental	painted turtle	1
Hay Coulee	8/5/2002	Incidental	boreal chorus frog plains gartersnake tiger salamander	2 2 70
Hwy 5 48.80068, 105.34538	7/20/2002	Incidental	smooth greensnake	2
Jitney Road 47.12218, 108.15691	9/2/2002	Incidental	greater short-horned lizard	1
Lake Creek	6/19/2003	Incidental	boreal chorus frog	1
Little Cottonwood Creek	5/25/2003	Incidental	northern leopard frog painted turtle	1 1
	7/12/2003	Survey	northern leopard frog painted turtle	11 2
		Incidental	northern leopard frog plains gartersnake	1 1
Little Dry Creek	9/8/2004	Survey	northern leopard frog plains gartersnake	517 1
Little Pumpkin Creek	7/24/2003	Survey Incidental	northern leopard frog plains gartersnake	7 1
Little Sage Creek	8/3/2002	Incidental	plains gartersnake	1
Little Warm Creek	8/9/2004	Incidental	northern leopard frog	1
Lodge Creek	8/25/2004	Survey Incidental	northern leopard frog northern leopard frog	1 1
Lodge Grass Creek	7/25/2004	Survey Incidental	northern leopard frog northern leopard frog plains gartersnake	1 2 3

McClelland Ferry 47.73590, 109.38880	6/26/2002	Incidental	spiny softshell	1
Muddy Creek	6/6/2002	Incidental	gophersnake	1
Murray Coulee	8/7/2002	Survey	northern leopard frog	6
		Incidental	northern leopard frog	4
			plains gartersnake	1
North Fork Burns Creek	6/20/2002	Incidental	plains gartersnake	1
			western rattlesnake	1
	7/25/2002	Survey	northern leopard frog	116
		Incidental	eastern racer	1
			gophersnake	1
			western rattlesnake	2
North Fork Willow Creek	7/22/2003	Survey	northern leopard frog	14
			painted turtle	2
North Sunday Creek	9/4/2003	Incidental	northern leopard frog	1
			Woodhouse's toad	1
North Willow Creek	5/26/2002	Incidental	boreal chorus frog	1
			Great Plains toad	1
			greater short-horned lizard	1
			western rattlesnake	1
	8/29/2002	Survey	eastern racer	1
Owl Creek	8/11/2003	Survey	northern leopard frog	83
Pine Creek	7/28/2003	Survey	northern leopard frog	4
			plains gartersnake	6
			tiger salamander	1
			western rattlesnake	1
Police Creek	6/19/2002	Incidental	painted turtle	1
			plains gartersnake	1
	7/20/2002	Survey Incidental	northern leopard frog painted turtle	3 1
Prairie Elk Creek	8/10/2004	Survey	northern leopard frog	24
			plains gartersnake	1
		Incidental	northern leopard frog	15
Pryor Creek	7/28/2004	Survey	painted turtle	1



Rotten Grass Creek	7/26/2004	Survey	northern leopard frog	2
		Incidental	painted turtle	1
			northern leopard frog	2
Rt. 223 47.88642, 110.76223	6/5/2002	Incidental	gophersnake	1
			western rattlesnake	1
Sand Creek (Big Dry)	9/6/2004	Survey	northern leopard frog	69
			painted turtle	2
	Incidental		greater short-horned lizard	1
			painted turtle	3
Sand Creek (Powder)	7/23/2003	Survey	northern leopard frog	1
		Incidental	painted turtle	1
			western rattlesnake	1
Sarpy Creek	7/23/2004	Survey	northern leopard frog	2
		Incidental	northern leopard frog	2
			painted turtle	2
			snapping turtle	1
Sheep Creek	8/13/2004	Survey	northern leopard frog	11
		Incidental	eastern racer	1
			northern leopard frog	12
			painted turtle	1
			snapping turtle	4
Shonkin Creek	8/21/2004	Survey	eastern racer	1
			northern leopard frog	1
		Incidental	northern leopard frog	1
Snake Creek	8/25/2004	Survey	northern leopard frog	3
			Woodhouse's toad	1
		Incidental	northern leopard frog	1
Snow Coulee	7/19/2002	Incidental	painted turtle	1
South of Malta 48.23973, 107.80742	5/30/2002	Incidental	gophersnake	2
South Sunday Creek	6/20/2002	Incidental	boreal chorus frog	1
			snapping turtle	1
	9/4/2002	Survey	northern leopard frog	1
			Woodhouse's toad	4
	Incidental		boreal chorus frog	1
			Great Plains toad	1

Steves Fork	5/28/2002	Incidental	boreal chorus frog	1
			Woodhouse's toad	1
Steves Fork	7/5/2002	Survey	gophersnake	1
Steves Fork	9/25/2002	Survey	northern leopard frog	1
Steves Fork	5/22/2003	Incidental	boreal chorus frog	1
			Woodhouse's toad	1
Steves Fork	7/9/2003	Survey	Woodhouse's toad	2
		Incidental	boreal chorus frog	2
			plains spadefoot	2
Steves Fork	9/16/2003	Incidental	northern leopard frog	2
Steves Fork	7/10/2004	Survey	gophersnake	1
		Incidental	Woodhouse's toad	1
Steves Fork	9/14/2004	Survey	northern leopard frog	1
Telegraph Creek	6/24/2003	Incidental	plains gartersnake	1
	7/13/2003	Survey	plains gartersnake	1
Thompson Creek (Little Dry)	5/28/2002	Incidental	northern leopard frog	1
			Woodhouse's toad	1
Thompson Creek (Little Dry)	6/25/2002	Incidental	boreal chorus frog	1
			northern leopard frog	1
			plains gartersnake	1
			plains spadefoot	1
			Woodhouse's toad	1
Thompson Creek (Little Dry)	7/10/2002	Survey	northern leopard frog	11
			Woodhouse's toad	2
Thompson Creek (Little Dry)		Incidental	northern leopard frog	10
Thompson Creek (Little Dry)	9/26/2002	Survey	northern leopard frog	14
Thompson Creek (Little Dry)	5/23/2003	Incidental	boreal chorus frog	1
			eastern racer	1
			northern leopard frog	1
			painted turtle	1
			Woodhouse's toad	1
Thompson Creek (Little Dry)	7/8/2003	Survey	gophersnake	1
			northern leopard frog	3

			plains gartersnake	2
			Woodhouse's toad	2
Thompson Creek (Little Dry)		Incidental	northern leopard frog	11
Thompson Creek (Little Dry)	9/15/2003	Survey	northern leopard frog	25
			painted turtle	1
			plains gartersnake	1
Thompson Creek (Little Dry)	7/9/2004	Survey	northern leopard frog	13
			plains gartersnake	4
			Woodhouse's toad	1
		Incidental	northern leopard frog	2
Thompson Creek (Little Dry)	9/13/2004	Survey	northern leopard frog	68
			plains gartersnake	1
		Incidental	northern leopard frog	1
Thompson Creek (Little Missouri)	7/24/2004	Survey	eastern racer	1
		Incidental	northern leopard frog	1
			tiger salamander	3
Timber Creek (Fort Peck)	9/7/2004	Incidental	tiger salamander	2
Timber Creek (Powder)	6/9/2003	Incidental	boreal chorus frog	1
			Woodhouse's toad	1
	7/25/2003	Survey	boreal chorus frog	1
			plains gartersnake	1
Trail Creek (Tongue)	6/23/2002	Incidental	painted turtle	1
Tule Creek	7/22/2002	Survey	northern leopard frog	4
			plains gartersnake	4
		Incidental	northern leopard frog	5
			painted turtle	3
			plains gartersnake	1
Tullock Creek	8/9/2003	Survey	painted turtle	1
		Incidental	northern leopard frog	2
			snapping turtle	1
West Blacktail Creek	6/10/2003	Incidental	boreal chorus frog	1
			Woodhouse's toad	1
	8/7/2003	Survey	painted turtle	1
		Incidental	painted turtle	1
West Charlie Creek	6/18/2002	Incidental	painted turtle	1
			Woodhouse's toad	1

	7/24/2002	Survey	northern leopard frog	9
			painted turtle	2
		Incidental	northern leopard frog	4
			painted turtle	1
Wild Horse Creek	5/26/2003	Incidental	boreal chorus frog	1
			eastern racer	1
Willow Creek (Musselshell)	8/6/2003	Incidental	northern leopard frog	1
Wolf Creek	7/15/2004	Survey	common sagebrush lizard	19
			eastern racer	1
			plains gartersnake	2
		Incidental	eastern racer	3
Woody Island Coulee	9/5/2004	Incidental	northern leopard frog	2
Grand Total				1,831

Table 4. Birds observed during 2002-2004.

Site	Date	Survey or incidental	Species	Number observed
Assiniboine Creek	5/31/2002	Survey	American robin	3
			American wigeon	3
			black-billed magpie	1
			brown-headed cowbird	5
			common grackle	2
			common snipe	1
			common yellowthroat	1
			eastern kingbird	4
			horned lark	2
			killdeer	3
			loggerhead shrike	2
			mallard	3
			marbled godwit	6
			mourning dove	3
			red-winged blackbird	4
			ring-necked pheasant	1
			western meadowlark	5
			willet	3
			Wilson's phalarope	5
		Incidental	American coot	
			American goldfinch	
			American green-winged teal	
			American wigeon	
			barn swallow	
			black-billed magpie	
			black-crowned night-heron	
			blue-winged teal	
			brown thrasher	
			brown-headed cowbird	
			California gull	
			common grackle	
			common yellowthroat	
			eastern kingbird	
			ferruginous hawk	
			killdeer	
			least sandpiper	
			loggerhead shrike	
			long-billed curlew	
			marbled godwit	
			mourning dove	
			northern harrier	
			red-winged blackbird	
			ring-necked pheasant	
			sora	
			upland sandpiper	

		western meadowlark	
		willet	
		Wilson's phalarope	
		yellow warbler	
		yellow-rumped warbler	
6/26/2002	Survey	American robin	1
		American wigeon	1
		blue-winged teal	1
		brown-headed cowbird	8
		common grackle	2
		double-crested cormorant	1
		eastern kingbird	2
		European starling	4
		horned lark	1
		killdeer	7
		lark bunting	1
		loggerhead shrike	2
		mallard	2
		marbled godwit	4
		mourning dove	4
		red-winged blackbird	9
		ring-necked pheasant	2
		western meadowlark	9
		willet	1
		yellow-headed blackbird	2
	Incidental	American goldfinch	
		barn swallow	
		black-billed magpie	
		black-crowned night-heron	
		sora	
		Wilson's phalarope	
5/26/2003	Survey	American robin	3
		American wigeon	1
		black-billed magpie	1
		blue-winged teal	1
		Brewer's blackbird	1
		brown thrasher	2
		brown-headed cowbird	5
		California gull	1
		Canada goose	8
		common grackle	6
		common snipe	4
		eastern kingbird	2
		killdeer	6
		lark sparrow	1
		mallard	1
		marbled godwit	4
		mourning dove	4
		northern shoveler	1

		red-winged blackbird	10
		ring-necked pheasant	4
		unknown blackbird	1
		western kingbird	5
		western meadowlark	7
		willet	4
		Wilson's phalarope	5
	Incidental	American wigeon	
		bank swallow	
		cliff swallow	
		common yellowthroat	
		gadwall	
		mallard	
		northern pintail	
6/25/2003	Survey	American robin	1
		bank swallow	1
		blue-winged teal	1
		Brewer's blackbird	4
		brown-headed cowbird	1
		common grackle	3
		common nighthawk	9
		eastern kingbird	3
		gray partridge	1
		horned lark	1
		killdeer	2
		mallard	1
		marbled godwit	5
		mourning dove	7
		red-winged blackbird	29
		western meadowlark	8
		willet	2
		Wilson's phalarope	2
	Incidental	ring-necked pheasant	
5/20/2004	Survey	American wigeon	2
		brown-headed cowbird	7
		Canada goose	2
		cliff swallow	1
		common grackle	5
		common snipe	1
		killdeer	2
		long-billed curlew	1
		mallard	4
		marbled godwit	3
		mourning dove	7
		northern shoveler	1
		red-winged blackbird	10
		ring-necked pheasant	2
		western meadowlark	9
		willet	3

Big Dry Creek	6/30/2004	Incidental	American wigeon	
			blue-winged teal	
			clay-colored sparrow	
			northern harrier	
			northern shoveler	
		Survey	American robin	2
			barn swallow	1
			black-billed magpie	1
			Brewer's blackbird	1
			brown-headed cowbird	6
			cliff swallow	3
			common grackle	7
			eastern kingbird	3
			killdeer	6
			mourning dove	6
			red-winged blackbird	12
			ring-necked pheasant	2
			western meadowlark	6
Big Porcupine Creek	5/27/2002	Incidental	blue-winged teal	
		Survey	American goldfinch	2
			American kestrel	1
			American wigeon	1
			brown thrasher	1
			Canada goose	4
			cliff swallow	7
			eastern kingbird	1
			horned lark	1
			killdeer	1
			lark bunting	8
			lark sparrow	3
			mallard	2
			mourning dove	2
			northern flicker	1
			red-winged blackbird	8
			rock wren	2
			unknown woodpecker	1
			upland sandpiper	2
			western meadowlark	8
	6/14/2004	Incidental	American kestrel	
			killdeer	
			upland sandpiper	
		Survey	American wigeon	2
			brown-headed cowbird	2
			Bullock's oriole	4
			common grackle	4
			eastern kingbird	6
			European starling	2
			field sparrow	1
			house wren	2



			mourning dove	9
			northern harrier	1
			prairie falcon	1
			red-headed woodpecker	2
			red-winged blackbird	5
			unknown blackbird	2
			upland sandpiper	2
			western kingbird	2
			western meadowlark	5
			western wood-pewee	1
			yellow warbler	3
Bitter Creek	6/22/2002	Survey	American robin	1
			brown-headed cowbird	1
			Bullock's oriole	2
			Cassin's kingbird	3
			chipping sparrow	2
			common grackle	4
			common nighthawk	1
			eastern kingbird	2
			European starling	6
			house wren	5
			lark sparrow	3
			mourning dove	4
			northern flicker	3
			unknown woodpecker	2
			western kingbird	9
			western meadowlark	6
			western wood-pewee	2
			yellow warbler	7
		Incidental	cliff swallow	
			common poorwill	
			spotted towhee	
			white-throated swift	
Black Coulee	6/20/2003	Survey	brown-headed cowbird	2
			cliff swallow	14
			eastern kingbird	2
			horned lark	12
			killdeer	9
			lark bunting	13
			mallard	6
			mourning dove	1
			red-winged blackbird	18
			unknown gull	1
			unknown sparrow	1
			western kingbird	1
		Incidental	gadwall	
			northern pintail	
Blood Creek	5/29/2002	Survey	Bullock's oriole	1
			Canada goose	2

			chipping sparrow	1
			eastern kingbird	1
			lark bunting	18
			lark sparrow	8
			mourning dove	1
			Say's phoebe	3
			vesper sparrow	2
			western kingbird	7
			western meadowlark	10
			yellow warbler	1
	Incidental		American kestrel	
			brown-headed cowbird	
			Bullock's oriole	
			chipping sparrow	
			common poorwill	
			house wren	
			lark sparrow	
			lazuli bunting	
			mountain bluebird	
			northern flicker	
			red-breasted nuthatch	
			rock wren	
			Say's phoebe	
			spotted towhee	
			violet-green swallow	
			western kingbird	
			yellow-rumped warbler	
Boxelder Creek	6/19/2002	Survey	blue-winged teal	3
			Brewer's blackbird	4
			brown thrasher	1
			brown-headed cowbird	12
			clay-colored sparrow	4
			common grackle	1
			common yellowthroat	3
			eastern kingbird	3
			killdeer	3
			lark bunting	4
			mallard	3
			mourning dove	4
			northern harrier	1
			northern rough-winged swallow	1
			red-winged blackbird	6
			ring-necked pheasant	3
			song sparrow	3
			upland sandpiper	3
			western meadowlark	5
			willet	1
			yellow warbler	2

Brazil Creek	6/27/2004	Survey	barn swallow	8
			brown-headed cowbird	7
			common nighthawk	1
			horned lark	2
			lark bunting	12
			mourning dove	4
			red-winged blackbird	6
			unknown duck	1
			western meadowlark	2
Buggy Creek	6/10/2002	Survey	American robin	2
			black-capped chickadee	2
			brown-headed cowbird	3
			Bullock's oriole	1
			common grackle	1
			European starling	5
			house wren	7
			killdeer	2
			long-billed curlew	1
			mallard	1
			mourning dove	1
			northern flicker	4
			ovenbird	1
			ring-necked pheasant	2
			song sparrow	1
			warbling vireo	1
			western meadowlark	6
			yellow warbler	11
		Incidental	American kestrel	
			Baltimore oriole	
			blue-winged teal	
			double-crested cormorant	
			eastern kingbird	
			field sparrow	
			hairy woodpecker	
			lark sparrow	
			loggerhead shrike	
			Sprague's pipit	
Cabin Creek	6/13/2003	Survey	unknown empidonax	
			western kingbird	
			blue-winged teal	1
			Brewer's sparrow	3
			brown-headed cowbird	3
			common grackle	2
			lark bunting	2
			mourning dove	2
			northern flicker	1
			red-winged blackbird	14
			western meadowlark	9
			willet	1

		Incidental	Canada goose	
			common nighthawk	
			Wilson's phalarope	
Calf Creek	6/1/2004	Survey	American goldfinch	1
			American robin	8
			belted kingfisher	1
			black-headed grosbeak	1
			Brewer's blackbird	1
			brown thrasher	2
			brown-headed cowbird	1
			Canada goose	1
			European starling	1
			field sparrow	1
			house wren	3
			lazuli bunting	2
			least flycatcher	3
			mourning dove	6
			ring-necked pheasant	6
			spotted towhee	2
			western meadowlark	2
			western wood-pewee	2
			yellow warbler	6
			yellow-breasted chat	1
		Incidental	Swainson's thrush	
			western meadowlark	
Cameron Creek	6/11/2003	Survey	clay-colored sparrow	3
			cliff swallow	1
			horned lark	8
			killdeer	2
			lark bunting	4
			mourning dove	1
			red-winged blackbird	1
			rock wren	1
			Say's phoebe	1
			vesper sparrow	2
			western meadowlark	9
		Incidental	eastern kingbird	
Canyon Creek	6/17/2004	Survey	American robin	5
			bank swallow	1
			cedar waxwing	1
			common yellowthroat	1
			downy woodpecker	1
			European starling	7
			gray catbird	2
			least flycatcher	1
			mallard	2
			mourning dove	4
			red-winged blackbird	1
			western kingbird	1

			western meadowlark	1
			western wood-pewee	2
			willow flycatcher	1
			yellow warbler	5
			yellow-breasted chat	2
		Incidental	black-capped chickadee	
			lark sparrow	
Cherry Creek	6/12/2004	Survey	bank swallow	2
			Brewer's blackbird	1
			brown-headed cowbird	6
			eastern kingbird	3
			horned lark	7
			killdeer	1
			lark bunting	6
			lark sparrow	1
			mallard	2
			mourning dove	2
			unknown blackbird	2
			vesper sparrow	1
			western meadowlark	4
Chip Creek	5/27/2003	Survey	brown-headed cowbird	8
			cliff swallow	3
			killdeer	1
			mallard	2
			marbled godwit	1
			mourning dove	1
			red-winged blackbird	5
			ring-necked pheasant	1
			Say's phoebe	1
			vesper sparrow	4
			western meadowlark	10
		Incidental	cliff swallow	
			upland sandpiper	
			willet	
Choteau Coulee	6/9/2002	Survey	Brewer's blackbird	1
			brown thrasher	1
			brown-headed cowbird	3
			common merganser	4
			European starling	4
			horned lark	1
			killdeer	1
			lark sparrow	1
			western meadowlark	9
		Incidental	American robin	
			common grackle	
			mallard	
			marbled godwit	
			mourning dove	
			ring-necked pheasant	

			rock wren	
			unknown empidonax	
			vesper sparrow	
			willet	
			yellow warbler	
Cottonwood Coulee	5/25/2003	Survey	American wigeon	2
			Baird's sparrow	1
			blue-winged teal	4
			brown-headed cowbird	1
			chestnut-collared longspur	5
			horned lark	6
			killdeer	7
			mallard	2
			marbled godwit	2
			northern harrier	1
			northern shoveler	1
			red-winged blackbird	10
			savannah sparrow	1
			western meadowlark	3
			willet	1
			Wilson's phalarope	12
		Incidental	McCown's longspur	
Cottonwood Creek (Big Muddy)	6/8/2003	Survey	American robin	1
			bank swallow	2
			Brewer's blackbird	1
			brown-headed cowbird	8
			clay-colored sparrow	4
			cliff swallow	29
			common grackle	4
			eastern kingbird	3
			European starling	1
			grasshopper sparrow	2
			horned lark	2
			house sparrow	3
			killdeer	1
			lark bunting	6
			least flycatcher	1
			mallard	3
			mourning dove	2
			red-winged blackbird	2
			ring-necked pheasant	3
			savannah sparrow	1
			song sparrow	3
			Sprague's pipit	2
			vesper sparrow	1
			warbling vireo	1
			western kingbird	2
			western meadowlark	6

		Incidental	American white pelican bank swallow blue-winged teal common snipe gadwall lesser scaup northern pintail Say's phoebe brown thrasher	3
Cottonwood Creek (Frenchman)	5/24/2003	Survey	brown-headed cowbird field sparrow mallard merlin mourning dove red-winged blackbird spotted towhee western meadowlark	6 2 1 1 5 5 3 12
		Incidental	black-billed magpie gray catbird gray partridge lesser scaup loggerhead shrike merlin pied-billed grebe sharp-tailed grouse Sprague's pipit upland sandpiper	
Cottonwood Creek (Marias)	6/6/2002	Survey	American robin black-billed magpie brown thrasher brown-headed cowbird clay-colored sparrow horned lark house sparrow mallard mountain bluebird mourning dove northern harrier unknown sparrow unknown swallow violet-green swallow western kingbird western meadowlark	1 3 1 14 1 2 1 1 1 5 1 1 1 3 5
		Incidental	eastern kingbird gray partridge lark sparrow violet-green swallow	
Crooked Creek	6/3/2004	Survey	barn swallow	4

Crow Creek (Powder)	6/21/2002	Incidental Survey	Brewer's blackbird	3
			field sparrow	1
			killdeer	4
			lark sparrow	1
			mourning dove	6
			northern rough-winged swallow	1
			red-winged blackbird	4
			Say's phoebe	5
			unknown blackbird	1
			vesper sparrow	2
			western meadowlark	10
			lark sparrow	
			American kestrel	2
			brown-headed cowbird	2
			cliff swallow	55
		Incidental	eastern kingbird	2
			field sparrow	4
			horned lark	1
			killdeer	1
			lark bunting	6
			loggerhead shrike	1
			mourning dove	1
			northern flicker	1
			red-winged blackbird	8
			upland sandpiper	2
			western meadowlark	7
			blue-winged teal	
			Brewer's blackbird	
			brown thrasher	
			Bullock's oriole	
			common grackle	
			common nighthawk	
			golden eagle	
			great blue heron	
			red-headed woodpecker	
			red-tailed hawk	
			western kingbird	
Crow Creek (Rock)	5/31/2002	Survey	American goldfinch	1
			barn swallow	1
			Brewer's blackbird	8
			brown thrasher	1
			brown-headed cowbird	3
			eastern kingbird	2
			horned lark	1
			killdeer	1
			lark bunting	1
			lesser scaup	3
			loggerhead shrike	2



		mourning dove	10
		red-winged blackbird	2
		unknown blackbird	3
		unknown duck	2
		western meadowlark	8
	Incidental	blue-winged teal	
		brown thrasher	
		gray partridge	
		house wren	
		lesser scaup	
		loggerhead shrike	
		mallard	
		sharp-tailed grouse	
		Swainson's hawk	
		vesper sparrow	
		willet	
6/24/2002	Survey	American kestrel	1
		black-billed magpie	1
		Brewer's blackbird	2
		brown thrasher	3
		brown-headed cowbird	17
		common nighthawk	2
		eastern kingbird	5
		horned lark	3
		lark bunting	8
		loggerhead shrike	2
		mallard	2
		mourning dove	6
		red-winged blackbird	2
		unknown duck	3
		unknown sparrow	1
		western meadowlark	11
	Incidental	barn swallow	
		Brewer's blackbird	
		common nighthawk	
		killdeer	
		Sprague's pipit	
		willet	
5/24/2003	Survey	American wigeon	1
		black-billed magpie	2
		Brewer's blackbird	10
		brown thrasher	2
		brown-headed cowbird	16
		eastern kingbird	3
		loggerhead shrike	3
		mallard	1
		mourning dove	4
		red-winged blackbird	6
		ring-billed gull	2

		sharp-tailed grouse	2
		vesper sparrow	1
		western meadowlark	4
		willet	2
	Incidental	Baird's sparrow	
		bank swallow	
		blue-winged teal	
		bobolink	
		Canada goose	
		clay-colored sparrow	
		gadwall	
		killdeer	
		northern pintail	
		sharp-tailed grouse	
		Sprague's pipit	
		upland sandpiper	
		willet	
6/25/2003	Survey	Brewer's blackbird	12
		brown thrasher	1
		brown-headed cowbird	1
		eastern kingbird	3
		gadwall	2
		horned lark	7
		lark bunting	8
		lesser scaup	4
		loggerhead shrike	1
		marbled godwit	5
		mourning dove	3
		red-winged blackbird	5
		ring-necked pheasant	1
		Sprague's pipit	3
		western meadowlark	14
	Incidental	American wigeon	
		bank swallow	
		common nighthawk	
		great blue heron	
		killdeer	
		mallard	
		ring-necked pheasant	
		sharp-tailed grouse	
		willet	
5/21/2004	Survey	Brewer's blackbird	4
		brown-headed cowbird	10
		eastern kingbird	1
		gadwall	6
		killdeer	1
		mallard	2
		marbled godwit	1
		mourning dove	2

			northern harrier	3
			northern pintail	1
			red-winged blackbird	3
			unknown blackbird	1
			unknown sparrow	9
			western meadowlark	12
		Incidental	brown thrasher	
			chipping sparrow	
			lesser scaup	
			loggerhead shrike	
			long-billed curlew	
			unknown flycatcher	
6/29/2004	Survey		American crow	1
			black-billed magpie	1
			brown-headed cowbird	15
			eastern kingbird	3
			horned lark	1
			lark bunting	1
			lark sparrow	1
			mourning dove	2
			northern pintail	1
			red-winged blackbird	1
			Sprague's pipit	1
			western meadowlark	10
		Incidental	northern harrier	
			unknown duck	
Currant Creek	6/24/2002	Survey	American goldfinch	1
			American robin	4
			blue-winged teal	2
			Brewer's blackbird	9
			Bullock's oriole	1
			cliff swallow	1
			eastern kingbird	2
			European starling	4
			killdeer	4
			mallard	2
			marbled godwit	1
			mourning dove	4
			northern flicker	1
			red-winged blackbird	6
			spotted sandpiper	1
			unknown duck	1
			upland sandpiper	4
			vesper sparrow	4
			western meadowlark	12
			western wood-pewee	2
			yellow-headed blackbird	1
		Incidental	black-capped chickadee	
			brown-headed cowbird	

			chipping sparrow	
			common nighthawk	
			dusky flycatcher	
			lark sparrow	
			mountain bluebird	
			red crossbill	
			red-tailed hawk	
			sandhill crane	
			turkey vulture	
			white-breasted nuthatch	
Deep Creek	5/27/2004	Survey	American robin	5
			black-billed magpie	3
			brown-headed cowbird	3
			California gull	1
			cliff swallow	17
			European starling	4
			gray catbird	1
			killdeer	5
			lark bunting	1
			mourning dove	1
			Swainson's thrush	2
			unknown blackbird	1
			unknown gull	1
			vesper sparrow	1
			western meadowlark	3
			yellow-rumped warbler	4
Dog Creek	5/29/2002	Survey	American kestrel	4
			American robin	3
			black-billed magpie	5
			black-capped chickadee	2
			Canada goose	2
			cliff swallow	11
			killdeer	2
			mourning dove	4
			northern flicker	1
			red-winged blackbird	1
			rock dove	3
			rock wren	1
			unknown blackbird	1
			violet-green swallow	8
			western meadowlark	3
		Incidental	American goldfinch	
			chipping sparrow	
			common poorwill	
			golden eagle	
			pinyon jay	
			vesper sparrow	
	6/26/2002	Survey	American robin	2
			black-billed magpie	8

		golden eagle	4
		mourning dove	2
		northern flicker	3
		pinyon jay	3
		rock dove	2
		rock wren	4
		spotted towhee	2
		western meadowlark	2
		white-throated swift	2
	Incidental	chipping sparrow	
		common nighthawk	
		common poorwill	
		golden eagle	
		great horned owl	
		house wren	
		lark sparrow	
		pinyon jay	
		spotted towhee	
		vesper sparrow	
5/27/2003	Survey	American kestrel	3
		American robin	3
		black-billed magpie	7
		brown-headed cowbird	1
		Canada goose	5
		common raven	1
		gadwall	4
		killdeer	1
		mallard	2
		mourning dove	3
		northern flicker	1
		pinyon jay	6
		ring-necked pheasant	1
		rock dove	5
		unknown blackbird	1
		unknown swallow	7
		western meadowlark	2
	Incidental	American goldfinch	
		chipping sparrow	
		rock wren	
		spotted towhee	
		vesper sparrow	
		violet-green swallow	
6/26/2003	Survey	American kestrel	2
		American robin	2
		black-billed magpie	5
		cliff swallow	44
		golden eagle	1
		mourning dove	5
		northern flicker	1

			ring-necked pheasant	1
			rock dove	5
			rock wren	2
			western meadowlark	5
		Incidental	black-capped chickadee	
			chipping sparrow	
			common nighthawk	
			lark sparrow	
			mountain bluebird	
			spotted towhee	
			vesper sparrow	
			violet-green swallow	
5/27/2004	Survey		American kestrel	5
			American robin	1
			black-billed magpie	4
			black-capped chickadee	1
			chipping sparrow	1
			European starling	1
			mallard	1
			mourning dove	4
			rock dove	7
			rock wren	4
			unknown blackbird	1
			western meadowlark	7
		Incidental	black-billed magpie	
7/1/2004	Survey		American kestrel	1
			black-billed magpie	1
			black-headed grosbeak	1
			merlin	1
			mourning dove	2
			rock dove	3
			Say's phoebe	1
			western meadowlark	5
			white-breasted nuthatch	1
			yellow warbler	2
		Incidental	dark-eyed junco	
			golden eagle	
Dry Creek	6/8/2003	Survey	bank swallow	1
			Brewer's blackbird	2
			brown thrasher	1
			brown-headed cowbird	9
			eastern kingbird	3
			field sparrow	4
			killdeer	2
			mourning dove	3
			red-winged blackbird	5
			upland sandpiper	1
			vesper sparrow	2
			western meadowlark	6

Dry Fork Marias River	5/29/2004	Incidental Survey	yellow warbler	2
			mallard	
			bank swallow	2
			black-billed magpie	1
			brown-headed cowbird	3
			eastern kingbird	2
			killdeer	3
			lark bunting	1
			lark sparrow	4
			mourning dove	4
			red-tailed hawk	2
			red-winged blackbird	4
			ring-necked pheasant	1
			Say's phoebe	1
			unknown blackbird	1
			unknown sparrow	1
			western meadowlark	7
			willet	1
		Incidental	American kestrel	
			American robin	
			mallard	
			marbled godwit	
Duck Creek (Big Sandy)	6/21/2003	Survey	unknown gull	
			American goldfinch	1
			brown-headed cowbird	1
			eastern kingbird	1
			European starling	1
			horned lark	10
			killdeer	2
			mourning dove	2
			red-winged blackbird	14
			unknown sparrow	1
			vesper sparrow	1
			western meadowlark	1
			yellow-headed blackbird	8
		Incidental	American crow	
			clay-colored sparrow	
Duck Creek (Redwater)	6/7/2003	Survey	Baird's sparrow	2
			bank swallow	3
			brown-headed cowbird	2
			chestnut-collared longspur	1
			gadwall	4
			horned lark	1
			killdeer	1
			mallard	3
			marbled godwit	3
			northern shoveler	1
			red-winged blackbird	10
			savannah sparrow	4

Eagle Creek (Big Muddy)	6/19/2002	Survey	unknown blackbird	1
			western meadowlark	9
			Baird's sparrow	1
			barn swallow	1
			bobolink	1
			brown-headed cowbird	7
			cliff swallow	9
			common snipe	3
			horned lark	2
			lark bunting	5
			marbled godwit	1
			northern flicker	1
			northern shoveler	2
			red-winged blackbird	11
			savannah sparrow	3
			unknown blackbird	1
			unknown swallow	3
			upland sandpiper	1
			western meadowlark	5
			Wilson's phalarope	4
		Incidental	long-billed curlew	
			sora	
			Sprague's pipit	
			willet	
Eagle Creek (Bullwhacker-Dog)	6/25/2004	Survey	yellow-headed blackbird	
			American goldfinch	2
			American robin	1
			brown-headed cowbird	4
			cedar waxwing	3
			clay-colored sparrow	2
			eastern kingbird	3
			European starling	1
			field sparrow	1
			gray catbird	3
			killdeer	1
			lark bunting	2
			mourning dove	7
			red-winged blackbird	1
			western meadowlark	4
			yellow warbler	4
Eagle Creek (Willow)	6/7/2002	Survey	barn swallow	1
			brown-headed cowbird	5
			clay-colored sparrow	2
			eastern kingbird	1
			horned lark	10
			long-billed curlew	2
			mallard	2
			mourning dove	2



			northern harrier	2
			red-winged blackbird	1
			unknown blackbird	1
			unknown gull	1
			vesper sparrow	2
			western meadowlark	1
			willet	1
		Incidental	American wigeon	
			gadwall	
			golden eagle	
			mallard	
			merlin	
			northern pintail	
East Fork Battle Creek	5/31/2004	Survey	American coot	1
			barn swallow	7
			brown-headed cowbird	7
			chipping sparrow	1
			cliff swallow	11
			eastern kingbird	1
			gadwall	2
			horned lark	1
			lark bunting	2
			mallard	5
			mourning dove	1
			northern harrier	1
			northern pintail	2
			red-winged blackbird	5
			Say's phoebe	1
			song sparrow	1
			unknown blackbird	1
			unknown gull	5
			western meadowlark	4
		Incidental	greater sage grouse	
			mallard	
East Fork Fox Creek	6/7/2003	Survey	bank swallow	3
			blue-winged teal	5
			brown-headed cowbird	1
			Canada goose	2
			gadwall	1
			grasshopper sparrow	1
			mallard	5
			mourning dove	2
			red-winged blackbird	15
			ring-necked pheasant	1
			western meadowlark	6
			Wilson's phalarope	2
			yellow-headed blackbird	1
		Incidental	killdeer	
East Fork Little Porcupine	6/22/2003	Survey	American wigeon	3

Creek

			blue-winged teal	5
			brown-headed cowbird	18
			common grackle	1
			eastern kingbird	4
			horned lark	2
			killdeer	2
			lark bunting	15
			red-winged blackbird	4
			savannah sparrow	1
			vesper sparrow	1
			western meadowlark	2
		Incidental	black-billed magpie	
			brown thrasher	
			chestnut-collared longspur	
			gadwall	
			loggerhead shrike	
			mallard	
			western meadowlark	
East Fork Little Powder	6/21/2002	Survey	American kestrel	3
			eastern kingbird	2
			European starling	3
			great blue heron	3
			mallard	3
			mourning dove	2
			red-winged blackbird	7
			unknown blackbird	1
			upland sandpiper	9
			western kingbird	3
			western meadowlark	12
		Incidental	great blue heron	
			northern flicker	
East Pryor Creek	6/16/2004	Survey	American goldfinch	4
			American robin	3
			black-billed magpie	2
			black-headed grosbeak	2
			Brewer's blackbird	2
			brown-headed cowbird	4
			Bullock's oriole	1
			cliff swallow	2
			eastern kingbird	2
			gray catbird	3
			house wren	2
			mourning dove	6
			red-winged blackbird	3
			Say's phoebe	1
			spotted towhee	3
			western meadowlark	1
			yellow warbler	6

East Redwater Creek	6/26/2004	Incidental	yellow-breasted chat	3
			eastern kingbird	
		Survey	horned lark	
			ring-necked pheasant	
			brown-headed cowbird	9
			common grackle	1
			eastern kingbird	4
			gadwall	1
			gray catbird	2
			killdeer	3
			lark sparrow	1
			long-billed curlew	1
			mallard	2
			mourning dove	5
			northern shoveler	1
			red-winged blackbird	10
			ring-necked pheasant	2
			upland sandpiper	1
			western kingbird	1
			western meadowlark	5
			Wilson's phalarope	1
			yellow warbler	2
		Incidental	American wigeon	
Elk Creek	5/25/2002	Incidental	blue-winged teal	
			barn swallow	1
		Survey	brown-headed cowbird	6
			Bullock's oriole	3
			eastern kingbird	4
			killdeer	1
			lark bunting	16
			loggerhead shrike	1
			mourning dove	8
			ring-necked pheasant	1
			Swainson's hawk	2
			unknown blackbird	1
			unknown swallow	1
			vesper sparrow	4
			western meadowlark	9
			yellow warbler	1
		Incidental	American kestrel	
			American redstart	
			blackpoll warbler	
			Cooper's hawk	
			golden eagle	
			great horned owl	
			long-billed curlew	
			Swainson's hawk	
			Tennessee warbler	
			unknown gull	

Flat Creek	5/30/2002	Survey	warbling vireo	
			willet	
			Canada goose	4
			common yellowthroat	1
			great blue heron	2
			horned lark	4
			killdeer	2
			lark bunting	8
			mallard	2
			mourning dove	5
			northern pintail	3
			ring-necked pheasant	2
			spotted sandpiper	2
			unknown blackbird	5
			unknown gull	3
			western meadowlark	5
			yellow warbler	1
		Incidental	American robin	
			American wigeon	
			blue-winged teal	
			Brewer's blackbird	
			cliff swallow	
			eastern kingbird	
			gray catbird	
			marbled godwit	
			unknown gull	
			upland sandpiper	
			willet	
	5/26/2004	Survey	American robin	2
			bank swallow	8
			brown-headed cowbird	11
			Canada goose	3
			common yellowthroat	2
			eastern kingbird	1
			killdeer	6
			lark bunting	2
			lark sparrow	2
			long-billed curlew	1
			mallard	7
			marbled godwit	1
			red-tailed hawk	1
			red-winged blackbird	8
			savannah sparrow	1
			unknown blackbird	2
			upland sandpiper	1
			vesper sparrow	1
			western meadowlark	4
		Incidental	common raven	
			Wilson's phalarope	

Fly Creek	6/23/2002	Survey	American kestrel	2
			American robin	3
			Baltimore oriole	1
			Bullock's oriole	2
			eastern kingbird	2
			European starling	31
			great horned owl	1
			horned lark	1
			house wren	4
			killdeer	1
			lark sparrow	4
			mourning dove	6
			red-tailed hawk	5
			red-winged blackbird	2
			ring-necked pheasant	2
			tree swallow	2
			western kingbird	1
			western meadowlark	3
			yellow warbler	2
Fogarty Coulee	6/23/2003	Survey	Baltimore oriole	
			great blue heron	
			American avocet	1
			Brewer's blackbird	8
			brown-headed cowbird	7
			horned lark	3
			killdeer	2
			marbled godwit	3
			northern pintail	1
			red-winged blackbird	3
			unknown gull	6
			vesper sparrow	8
			western meadowlark	5
			willet	7
		Incidental	bank swallow	
			blue-winged teal	
			gadwall	
Fords Creek	5/30/2002	Survey	northern pintail	
			American goldfinch	14
			American robin	1
			barn swallow	5
			brown-headed cowbird	1
			clay-colored sparrow	1
			common grackle	1
			eastern kingbird	6
			gadwall	2
			golden eagle	1
			gray catbird	3
			killdeer	2
			lark bunting	3

			long-billed curlew	4
			marbled godwit	5
			red-winged blackbird	2
			ring-necked pheasant	2
			upland sandpiper	2
			western meadowlark	5
			yellow warbler	5
			yellow-rumped warbler	1
		Incidental	American goldfinch	
			black-billed magpie	
			brown-headed cowbird	
			Bullock's oriole	
			Canada goose	
			chipping sparrow	
			gray catbird	
			killdeer	
			lark bunting	
			lark sparrow	
			marbled godwit	
			ring-necked pheasant	
			spotted towhee	
			upland sandpiper	
			vesper sparrow	
			western kingbird	
			western meadowlark	
			yellow warbler	
Foster Creek	6/22/2002	Survey	barn swallow	2
			cliff swallow	2
			grasshopper sparrow	6
			great blue heron	1
			killdeer	3
			lark bunting	5
			lark sparrow	1
			mourning dove	1
			red-winged blackbird	9
			unknown blackbird	3
			unknown sparrow	1
			unknown swallow	2
			western meadowlark	16
		Incidental	common snipe	
			great blue heron	
			mallard	
			Say's phoebe	
			upland sandpiper	
Hay Coulee	6/8/2002	Survey	chestnut-collared longspur	6
			gadwall	1
			horned lark	2
			killdeer	2
			lark bunting	3

			mallard	4
			northern pintail	2
			northern shoveler	2
			unknown blackbird	12
			unknown duck	10
			unknown hawk	1
		Incidental	American avocet	
			American wigeon	
			eastern kingbird	
			gadwall	
			horned lark	
			killdeer	
			red-winged blackbird	
			savannah sparrow	
			Say's phoebe	
			vesper sparrow	
Lake Creek	6/19/2003	Survey	bank swallow	1
			Brewer's blackbird	1
			brown-headed cowbird	2
			horned lark	29
			killdeer	1
			mallard	2
			marbled godwit	3
			red-winged blackbird	1
			unknown sparrow	3
			upland sandpiper	1
			western meadowlark	1
			willet	7
			yellow-headed blackbird	6
		Incidental	American wigeon	
			lark bunting	
			mallard	
			northern shoveler	
Little Cottonwood Creek	5/25/2003	Survey	American goldfinch	1
			American kestrel	2
			black-billed magpie	1
			brown thrasher	1
			brown-headed cowbird	5
			European starling	1
			gadwall	3
			killdeer	5
			lark bunting	2
			mallard	12
			mourning dove	4
			turkey vulture	1
			western kingbird	3
			western meadowlark	11
			willet	2
		Incidental	Baltimore oriole	

			bank swallow	
			Brewer's blackbird	
			eastern kingbird	
			gray partridge	
			lark sparrow	
			loggerhead shrike	
			marbled godwit	
			mountain bluebird	
			northern flicker	
			northern pintail	
			northern shoveler	
			red-winged blackbird	
			sharp-tailed grouse	
Little Dry Creek	6/28/2004	Survey	brown-headed cowbird	2
			chestnut-collared longspur	3
			cliff swallow	3
			common grackle	1
			horned lark	13
			killdeer	4
			lark bunting	12
			lark sparrow	2
			mourning dove	1
			red-winged blackbird	5
			western meadowlark	2
		Incidental	Wilson's phalarope	
Little Pumpkin Creek	6/5/2003	Survey	American goldfinch	1
			Brewer's blackbird	1
			common grackle	6
			common yellowthroat	2
			lark sparrow	1
			mourning dove	7
			red-winged blackbird	14
			ring-necked pheasant	1
			sandhill crane	2
			tree swallow	2
			unknown blackbird	4
			unknown duck	1
			violet-green swallow	4
			western wood-pewee	1
			yellow warbler	3
			yellow-headed blackbird	1
		Incidental	blue-winged teal	
			bobolink	
			brown-headed cowbird	
			Bullock's oriole	
			killdeer	
			lark sparrow	
			sora	
			Wilson's phalarope	



Little Sage Creek	6/7/2002	Survey	American crow	2
			Brewer's blackbird	4
			brown-headed cowbird	6
			clay-colored sparrow	6
			eastern kingbird	9
			gadwall	2
			horned lark	4
			mallard	3
			mourning dove	1
			northern harrier	1
			ring-necked pheasant	5
			savannah sparrow	4
			unknown swallow	1
			vesper sparrow	8
			western meadowlark	7
		Incidental	American goldfinch	
			Brewer's blackbird	
			Canada goose	
			clay-colored sparrow	
			cliff swallow	
			horned lark	
			northern harrier	
			ring-necked pheasant	
			savannah sparrow	
			sharp-tailed grouse	
Little Warm Creek	5/21/2004	Survey	Swainson's hawk	
			vesper sparrow	
			western meadowlark	
			American wigeon	2
			blue-winged teal	1
			brown-headed cowbird	18
			Canada goose	5
			cliff swallow	2
			common grackle	1
			gadwall	1
			horned lark	2
			lark bunting	4
			mallard	3
			marbled godwit	4
			northern shoveler	4
			northern shrike	2
			red-winged blackbird	6
			ring-billed gull	1
			unknown gull	7
			western meadowlark	5
			willet	1
Lodge Creek	5/30/2004	Survey	yellow-headed blackbird	1
			American goldfinch	3
			American robin	3

			barn swallow	5
			brown thrasher	2
			brown-headed cowbird	11
			California gull	1
			common grackle	3
			eastern kingbird	1
			European starling	6
			Franklin's gull	2
			house wren	2
			mallard	1
			mourning dove	3
			ring-necked pheasant	2
			savannah sparrow	1
			tree swallow	2
			unknown swallow	2
			western meadowlark	4
			yellow warbler	4
		Incidental	barn swallow	
			clay-colored sparrow	
			common merganser	
			great horned owl	
Lodge Grass Creek	6/15/2004	Survey	American robin	1
			black-headed grosbeak	1
			Brewer's blackbird	1
			brown-headed cowbird	1
			cliff swallow	25
			common yellowthroat	1
			ferruginous hawk	1
			killdeer	1
			lark sparrow	1
			least flycatcher	1
			mourning dove	1
			northern flicker	1
			savannah sparrow	4
			song sparrow	3
			unknown blackbird	1
			western wood-pewee	5
			Wilson's phalarope	1
			yellow warbler	5
		Incidental	ring-necked pheasant	
			yellow warbler	
Lost Creek	6/12/2003	Survey	American crow	2
			American goldfinch	1
			American kestrel	3
			black-billed magpie	1
			Brewer's blackbird	13
			European starling	5
			gray catbird	2
			lazuli bunting	2

			mourning dove	1
			spotted towhee	2
			vesper sparrow	1
			western meadowlark	6
			yellow warbler	1
		Incidental	common nighthawk	
			vesper sparrow	
McDonald Creek	6/3/2004	Survey	American robin	3
			brown-headed cowbird	4
			Canada goose	17
			cliff swallow	1
			common grackle	1
			eastern kingbird	4
			European starling	23
			horned lark	2
			killdeer	3
			lark bunting	6
			lark sparrow	1
			mourning dove	5
			red-winged blackbird	8
			ring-necked pheasant	1
			tree swallow	4
			western kingbird	1
			western meadowlark	5
			western wood-pewee	1
			yellow warbler	9
Muddy Creek	6/6/2002	Survey	American white pelican	11
			Brewer's blackbird	4
			cliff swallow	502
			eastern kingbird	1
			Franklin's gull	2
			horned lark	6
			killdeer	1
			lark sparrow	2
			mallard	2
			mourning dove	1
			northern harrier	1
			northern rough-winged swallow	2
			spotted sandpiper	1
			unknown gull	2
			vesper sparrow	2
			western meadowlark	3
		Incidental	brown-headed cowbird	
			eastern kingbird	
			ferruginous hawk	
			great horned owl	
			killdeer	
			lark sparrow	

			long-billed curlew	
			mallard	
			prairie falcon	
			spotted sandpiper	
			Swainson's hawk	
			vesper sparrow	
			western kingbird	
Murray Coulee	6/9/2002	Survey	blue-winged teal	1
			chestnut-collared longspur	5
			eastern kingbird	2
			horned lark	6
			marbled godwit	6
			northern pintail	1
			red-winged blackbird	11
			vesper sparrow	1
			western meadowlark	8
			willet	7
			Wilson's phalarope	13
		Incidental	barn swallow	
			savannah sparrow	
Nine Mile Coulee	6/8/2002	Survey	Brewer's blackbird	1
			chestnut-collared longspur	9
			horned lark	11
			lark bunting	10
			long-billed curlew	1
			unknown swallow	5
			western meadowlark	5
		Incidental	chestnut-collared longspur	
			long-billed curlew	
			northern harrier	
North Fork Burns Creek	6/20/2002	Survey	American crow	4
			American kestrel	2
			bank swallow	3
			bobolink	1
			brown thrasher	3
			brown-headed cowbird	9
			common grackle	2
			common snipe	6
			grasshopper sparrow	1
			horned lark	1
			killdeer	1
			lark sparrow	2
			long-billed curlew	3
			red-winged blackbird	1
			ring-necked pheasant	3
			spotted towhee	3
			Sprague's pipit	1
			upland sandpiper	4
			western meadowlark	7

North Fork Willow Creek	6/5/2003	Incidental	yellow warbler	2
			marbled godwit	
		Survey	red-tailed hawk	
			turkey vulture	
			American goldfinch	1
			bank swallow	6
			eastern kingbird	1
			European starling	5
			gadwall	2
			horned lark	2
			killdeer	1
			lark bunting	8
			mallard	2
			northern harrier	1
			red-winged blackbird	40
			western meadowlark	8
			yellow-headed blackbird	3
		Incidental	American wigeon	
			blue-winged teal	
			gadwall	
			northern shoveler	
			willet	
North Sunday Creek	6/4/2003	Survey	Wilson's phalarope	
			American kestrel	2
			American robin	4
			brown-headed cowbird	1
			Bullock's oriole	2
			eastern kingbird	1
			European starling	1
			field sparrow	1
			house wren	5
			mallard	2
			mourning dove	4
			red-winged blackbird	10
			western meadowlark	8
			yellow warbler	4
North Willow Creek	5/26/2002	Incidental	ring-necked pheasant	
			blue-winged teal	1
		Survey	Brewer's blackbird	7
			brown-headed cowbird	1
			cliff swallow	6
			horned lark	5
			killdeer	6
			lark bunting	7
			mallard	1
			northern harrier	2
			red-winged blackbird	5
			Say's phoebe	1
			unknown sparrow	3

			vesper sparrow	3
			western meadowlark	6
			Wilson's phalarope	3
		Incidental	orange-crowned warbler	
			rock dove	
			Tennessee warbler	
			Wilson's phalarope	
			yellow warbler	
O'Brien Coulee	6/1/2004	Survey	bank swallow	2
			brown-headed cowbird	5
			horned lark	12
			house wren	1
			lark bunting	11
			red-tailed hawk	1
			vesper sparrow	2
			western kingbird	1
			western meadowlark	4
		Incidental	Canada goose	
			lark sparrow	
			Swainson's thrush	
Owl Creek	6/11/2003	Survey	American goldfinch	1
			American robin	2
			black-capped chickadee	2
			Brewer's blackbird	10
			brown-headed cowbird	1
			eastern kingbird	1
			gray catbird	2
			house wren	5
			lark sparrow	2
			lazuli bunting	1
			least flycatcher	3
			mourning dove	2
			northern flicker	2
			northern rough-winged	1
			swallow	
			red-eyed vireo	2
			unknown duck	1
			very	2
			western wood-pewee	1
			yellow warbler	6
			yellow-breasted chat	2
		Incidental	American crow	
			Bullock's oriole	
			European starling	
			gray catbird	
			house wren	
			lark sparrow	
			lazuli bunting	
			least flycatcher	

			northern rough-winged swallow	
			ovenbird	
			red-eyed vireo	
			ring-necked pheasant	
			spotted towhee	
			unknown hawk	
			veery	
			western meadowlark	
			western wood-pewee	
			yellow warbler	
Pine Creek	6/20/2003	Survey	bobolink	3
			eastern kingbird	6
			killdeer	2
			mourning dove	2
			red-winged blackbird	9
			sharp-tailed grouse	2
			upland sandpiper	2
			western meadowlark	6
			Wilson's phalarope	2
		Incidental	common nighthawk	
			mallard	
			mourning dove	
			sharp-tailed grouse	
Pole Creek	6/4/2004	Survey	bank swallow	3
			brown-headed cowbird	9
			horned lark	2
			killdeer	2
			lark bunting	11
			lark sparrow	2
			mourning dove	2
			western meadowlark	12
Police Creek	6/19/2002	Survey	Baird's sparrow	8
			barn swallow	2
			blue-winged teal	2
			bobolink	3
			Brewer's blackbird	1
			brown-headed cowbird	7
			common snipe	3
			killdeer	2
			mallard	1
			marbled godwit	2
			red-winged blackbird	5
			savannah sparrow	5
			Sprague's pipit	5
			upland sandpiper	1
			western meadowlark	2
			Wilson's phalarope	7
		Incidental	bobolink	

Prairie Elk Creek	6/26/2004	Survey	chestnut-collared longspur	
			eastern kingbird	
			Brewer's blackbird	7
			brown-headed cowbird	3
			common grackle	6
			eastern kingbird	3
			field sparrow	1
			grasshopper sparrow	1
			killdeer	2
			lark bunting	1
			lark sparrow	1
			mallard	2
			mourning dove	3
			northern flicker	1
			red-winged blackbird	1
			ring-billed gull	1
			ring-necked pheasant	1
			upland sandpiper	2
			western kingbird	8
			western meadowlark	10
Pryor Creek	6/16/2004	Survey	American kestrel	1
			American robin	2
			black-billed magpie	1
			black-capped chickadee	1
			Brewer's blackbird	4
			common grackle	1
			common yellowthroat	3
			eastern kingbird	2
			European starling	1
			gray catbird	1
			hairy woodpecker	2
			house wren	2
			killdeer	1
			mourning dove	3
			red-winged blackbird	2
			ring-necked pheasant	3
			rock dove	3
			western meadowlark	1
			western wood-pewee	1
			yellow warbler	5
Rattlesnake Creek	6/2/2004	Survey	yellow-breasted chat	3
			American wigeon	
			ferruginous hawk	
			great blue heron	
			American goldfinch	2
			American wigeon	1
			brown-headed cowbird	6
			cliff swallow	30
			horned lark	1
		Incidental		



Rotten Grass Creek	6/15/2004	Survey	killdeer	2
			lark bunting	7
			mourning dove	2
			northern harrier	1
			red-winged blackbird	6
			vesper sparrow	2
			western meadowlark	6
			American goldfinch	2
			American robin	1
			Baltimore oriole	1
			Brewer's blackbird	1
			brown-headed cowbird	6
			Bullock's oriole	1
			cliff swallow	1
			common grackle	2
			common yellowthroat	1
			eastern kingbird	5
			gray catbird	4
			killdeer	1
			mourning dove	4
			northern harrier	2
			red-winged blackbird	4
			ring-necked pheasant	2
			unknown blackbird	5
			western meadowlark	1
			yellow warbler	11
Sage Creek (Wild Horse Lake)	6/22/2003	Survey	Brewer's blackbird	7
			Canada goose	6
			clay-colored sparrow	2
			common nighthawk	1
			eastern kingbird	2
			gadwall	2
			horned lark	15
			lark bunting	13
			mallard	1
			marbled godwit	1
			mourning dove	8
			northern harrier	1
			red-winged blackbird	11
			ring-necked pheasant	1
			unknown gull	2
			upland sandpiper	2
			western meadowlark	7
			Wilson's phalarope	4
		Incidental	American avocet	
			American bittern	
			western kingbird	
			willet	

Sand Creek	6/5/2003	Survey	American crow	1		
			American robin	1		
			Brewer's blackbird	1		
			brown-headed cowbird	5		
			eastern kingbird	5		
			house wren	4		
			lark sparrow	4		
			lazuli bunting	1		
			mountain bluebird	2		
			mourning dove	1		
			northern flicker	3		
			red-winged blackbird	3		
			unknown empidonax	1		
			western meadowlark	7		
			yellow warbler	7		
			Incidental	American robin		
				bank swallow		
				Bullock's oriole		
				killdeer		
	5/19/2004	Survey	western wood-pewee			
			American wigeon	13		
			brown-headed cowbird	7		
			Canada goose	9		
			gadwall	6		
			horned lark	6		
			killdeer	1		
			lark bunting	10		
			mallard	2		
			red-winged blackbird	4		
			unknown blackbird	1		
			unknown gull	1		
unknown sparrow			1			
western meadowlark			16			
Sarpy Creek			6/14/2004	Incidental	mallard	
				Survey	American robin	4
	black-billed magpie	4				
	Brewer's blackbird	2				
	brown-headed cowbird	2				
	clay-colored sparrow	1				
	eastern kingbird	4				
	killdeer	2				
	lark sparrow	6				
	mallard	1				
	mourning dove	3				
	red-winged blackbird	5				
ring-necked pheasant	2					
western kingbird	5					
western meadowlark	2					
western wood-pewee	2					

Sheep Creek	6/13/2004	Incidental Survey	yellow warbler	3
			western kingbird	
			American goldfinch	1
			Brewer's blackbird	1
			brown-headed cowbird	2
			cliff swallow	3
			common grackle	14
			eastern kingbird	5
			field sparrow	1
			lark bunting	8
			lark sparrow	4
			mourning dove	1
			northern flicker	2
			red-winged blackbird	3
			tree swallow	1
			unknown blackbird	1
			western kingbird	3
			western meadowlark	6
Shonkin Creek	5/28/2004	Survey	American goldfinch	4
			American kestrel	1
			American robin	3
			black-billed magpie	3
			brown thrasher	3
			brown-headed cowbird	1
			Canada goose	36
			clay-colored sparrow	2
			common yellowthroat	1
			gray catbird	4
			house wren	2
			mourning dove	4
			northern flicker	2
			red-breasted nuthatch	2
			ring-necked pheasant	5
			rock dove	1
			spotted towhee	2
			western meadowlark	3
			yellow warbler	7
			yellow-breasted chat	4
		Incidental	chipping sparrow	
			least flycatcher	
Sixshooter Creek	6/19/2003	Survey	Brewer's blackbird	6
			brown-headed cowbird	3
			chestnut-collared longspur	5
			cliff swallow	14
			horned lark	5
			long-billed curlew	1
			upland sandpiper	3
			western meadowlark	5
Snake Creek	5/30/2004	Survey	blue-winged teal	7

Snow Coulee	6/18/2002	Survey	brown-headed cowbird	9
			clay-colored sparrow	1
			gadwall	4
			horned lark	4
			lark bunting	3
			mallard	5
			red-winged blackbird	6
			ring-billed gull	1
			western meadowlark	9
			American wigeon	5
			barn swallow	4
			brown-headed cowbird	14
			common nighthawk	1
			eastern kingbird	1
			gadwall	4
			horned lark	5
			killdeer	2
			lark bunting	6
			mallard	5
			marbled godwit	5
			mourning dove	4
			northern pintail	1
			red-winged blackbird	11
			savannah sparrow	2
			upland sandpiper	1
			western meadowlark	5
			willet	3
			Wilson's phalarope	6
South Cottonwood Creek	6/10/2003	Survey	chestnut-collared longspur	
			common nighthawk	
			common snipe	
			northern harrier	
			American kestrel	1
			Brewer's blackbird	1
			brown-headed cowbird	4
			common grackle	2
			common nighthawk	1
			eastern kingbird	3
			European starling	1
			horned lark	2
			loggerhead shrike	3
			mourning dove	7
			northern flicker	2
			red-winged blackbird	4
South Fork Lisk Creek	6/8/2003	Survey	upland sandpiper	4
			western meadowlark	6
		Incidental	killdeer	
			ring-necked pheasant	
			American goldfinch	2

			American robin	2
			black-capped chickadee	3
			brown thrasher	4
			brown-headed cowbird	7
			eastern kingbird	3
			gray catbird	3
			house wren	8
			least flycatcher	3
			marbled godwit	5
			mourning dove	3
			red-winged blackbird	2
			ring-necked pheasant	7
			spotted towhee	1
			Sprague's pipit	1
			western kingbird	5
			western meadowlark	6
			yellow warbler	7
		Incidental	common nighthawk	
			Swainson's hawk	
			yellow-breasted chat	
South Sunday Creek	6/20/2002	Survey	Brewer's blackbird	1
			Brewer's sparrow	3
			eastern kingbird	1
			European starling	1
			horned lark	2
			lark bunting	14
			mourning dove	6
			unknown blackbird	2
			unknown hawk	1
			unknown sparrow	2
			western meadowlark	10
		Incidental	Brewer's sparrow	
			field sparrow	
			killdeer	
Sprague Creek	6/23/2003	Survey	Brewer's blackbird	4
			brown-headed cowbird	3
			chipping sparrow	1
			common nighthawk	1
			killdeer	2
			lark sparrow	1
			mourning dove	1
			red-winged blackbird	4
			western meadowlark	14
		Incidental	brown-headed cowbird	
Steves Fork	5/28/2002	Survey	Brewer's sparrow	1
			brown-headed cowbird	6
			cliff swallow	13
			gadwall	1
			horned lark	2

		killdeer	3
		lark bunting	49
		mallard	2
		mourning dove	2
		red-winged blackbird	4
		unknown sparrow	1
		vesper sparrow	1
		western meadowlark	9
	Incidental	Canada goose	
		great blue heron	
		mallard	
		Say's phoebe	
		vesper sparrow	
6/25/2002	Survey	American kestrel	1
		brown-headed cowbird	7
		cliff swallow	2
		eastern kingbird	2
		gadwall	1
		killdeer	3
		lark bunting	24
		mourning dove	2
		red-winged blackbird	1
		rock dove	2
		unknown duck	1
		western meadowlark	9
	Incidental	gadwall	
		mallard	
		rock dove	
		vesper sparrow	
		western kingbird	
5/22/2003	Survey	American white pelican	7
		Brewer's blackbird	3
		Brewer's sparrow	2
		brown-headed cowbird	3
		Canada goose	1
		cliff swallow	13
		horned lark	1
		killdeer	1
		lark bunting	20
		mallard	3
		northern shoveler	2
		red-winged blackbird	6
		unknown gull	1
		western meadowlark	5
	Incidental	American wigeon	
		Canada goose	
		gadwall	
		mourning dove	
		unknown hawk	

Telegraph Creek	6/26/2003	Survey	Brewer's blackbird	6
			Brewer's sparrow	2
			brown-headed cowbird	2
			cliff swallow	19
			double-crested cormorant	1
			horned lark	1
			lark bunting	19
			mallard	1
			mourning dove	2
			red-winged blackbird	2
			unknown gull	3
			western meadowlark	3
		Incidental	California gull	
			common snipe	
			killdeer	
	5/19/2004	Survey	brown-headed cowbird	8
			Canada goose	4
			gadwall	2
			horned lark	2
			killdeer	3
			lark bunting	20
			mallard	1
			northern harrier	1
			red-winged blackbird	4
			ring-billed gull	1
			Say's phoebe	1
			unknown blackbird	1
			unknown sparrow	1
			western meadowlark	4
		Incidental	barn swallow	
			cliff swallow	
			great blue heron	
			mallard	
			ring-necked pheasant	
			rock dove	
			Say's phoebe	
	6/28/2004	Survey	cliff swallow	27
			common grackle	2
			field sparrow	2
			horned lark	7
			killdeer	1
			lark bunting	11
			red-winged blackbird	2
			western meadowlark	2
	6/24/2003	Survey	American goldfinch	2
			American robin	3
			black-capped chickadee	1
			Brewer's blackbird	5
			brown thrasher	3

			brown-headed cowbird	5
			eastern kingbird	3
			house wren	3
			killdeer	3
			lark sparrow	1
			mallard	2
			mourning dove	7
			northern pintail	9
			red-winged blackbird	1
			ring-necked pheasant	2
			spotted sandpiper	1
			spotted towhee	4
			western kingbird	2
			western meadowlark	12
			western wood-pewee	2
			willet	2
			Wilson's phalarope	1
			yellow warbler	7
		Incidental	blue-winged teal	
			common nighthawk	
			grasshopper sparrow	
			northern shoveler	
			sora	
Thompson Creek (Little Dry)	5/28/2002	Survey	American goldfinch	4
			Canada goose	6
			grasshopper sparrow	1
			greater sage grouse	1
			horned lark	3
			killdeer	1
			lark bunting	16
			mallard	5
			mourning dove	2
			northern harrier	3
			northern rough-winged	2
			swallow	
			red-winged blackbird	9
			unknown swallow	1
			vesper sparrow	2
			western meadowlark	6
		Incidental	chestnut-collared longspur	
			common yellowthroat	
			grasshopper sparrow	
			marbled godwit	
			McCown's longspur	
			northern harrier	
			northern pintail	
			Swainson's hawk	
			wood duck	
			yellow-headed blackbird	



6/25/2002	Survey	American wigeon	1
		brown-headed cowbird	1
		eastern kingbird	2
		grasshopper sparrow	1
		horned lark	8
		killdeer	1
		lark bunting	18
		mallard	8
		mourning dove	1
		red-winged blackbird	2
		unknown duck	2
		unknown hawk	1
		unknown swallow	1
		western meadowlark	10
	Incidental	chestnut-collared longspur	
		mallard	
		sharp-tailed grouse	
5/23/2003	Survey	American goldfinch	1
		brown-headed cowbird	6
		Canada goose	4
		grasshopper sparrow	1
		horned lark	8
		lark bunting	9
		mallard	2
		mourning dove	2
		red-winged blackbird	8
		western meadowlark	12
		Wilson's phalarope	3
	Incidental	chestnut-collared longspur	
		grasshopper sparrow	
		lark sparrow	
		mallard	
		McCown's longspur	
		northern harrier	
		rock wren	
6/25/2003	Survey	vesper sparrow	
		field sparrow	1
		grasshopper sparrow	1
		horned lark	5
		killdeer	1
		lark bunting	15
		mourning dove	3
		red-winged blackbird	6
		western meadowlark	5
	Incidental	chestnut-collared longspur	
		grasshopper sparrow	
5/18/2004	Survey	lark sparrow	
		American wigeon	1
		Baird's sparrow	1

Thompson Creek (Little Missouri)	6/28/2004	Incidental Survey	brown-headed cowbird	8
			Canada goose	8
			horned lark	3
			lark bunting	15
			loggerhead shrike	1
			mallard	5
			red-winged blackbird	5
			savannah sparrow	1
			unknown blackbird	7
			unknown sparrow	1
			western meadowlark	7
			mallard	
			brown-headed cowbird	2
			eastern kingbird	2
			grasshopper sparrow	2
	6/13/2004	Incidental Survey	horned lark	5
			killdeer	2
			lark bunting	13
			red-winged blackbird	7
			western meadowlark	6
			savannah sparrow	
			American robin	4
			blue-winged teal	2
			Brewer's blackbird	2
			Brewer's sparrow	1
Timber Creek	6/9/2003	Survey	brown thrasher	1
			brown-headed cowbird	5
			common grackle	8
			eastern kingbird	3
			European starling	2
			greater sage grouse	7
			killdeer	4
			long-billed curlew	1
			mourning dove	4
			northern flicker	5
			red-winged blackbird	2
			western kingbird	1
			western meadowlark	8
			yellow warbler	2
			brown-headed cowbird	2
			horned lark	1
			lark bunting	15
			mallard	3
			mourning dove	6
			northern flicker	2
			red-winged blackbird	11
			western meadowlark	11
			Wilson's phalarope	1

Trail Creek	5/20/2004	Incidental	common nighthawk	
			eastern kingbird	
			killdeer	
			upland sandpiper	
		Survey	Baird's sparrow	3
			barn swallow	2
			brown-headed cowbird	3
			Canada goose	2
			chestnut-collared longspur	1
			eastern kingbird	1
			horned lark	6
			lark bunting	5
			northern shoveler	1
			red-winged blackbird	7
			savannah sparrow	1
			Sprague's pipit	2
			unknown blackbird	1
			western meadowlark	5
			Wilson's phalarope	8
	6/23/2002	Incidental	savannah sparrow	
		Survey	American robin	1
			brown-headed cowbird	3
			Bullock's oriole	1
			killdeer	8
			lark sparrow	2
			mourning dove	2
			northern flicker	1
			red-winged blackbird	9
			unknown sparrow	1
			upland sandpiper	1
			western meadowlark	8
		Incidental	American green-winged teal	
			American kestrel	
			black-capped chickadee	
			blue-winged teal	
			Brewer's blackbird	
			chipping sparrow	
			common nighthawk	
			golden eagle	
	5/29/2004		mallard	
			olive-sided flycatcher	
			red-tailed hawk	
			rock wren	
			Wilson's phalarope	
			yellow-rumped warbler	
		Survey	American crow	1
			American wigeon	1
			Brewer's blackbird	4
			brown-headed cowbird	7

			clay-colored sparrow	2
			cliff swallow	1
			eastern kingbird	2
			ferruginous hawk	1
			gadwall	2
			horned lark	7
			mallard	3
			northern harrier	1
			prairie falcon	1
			red-winged blackbird	1
			unknown blackbird	3
			unknown hawk	1
			vesper sparrow	3
			western meadowlark	6
		Incidental	American wigeon	
			Brewer's sparrow	
			northern shoveler	
Tule Creek	6/19/2002	Survey	barn swallow	4
			Brewer's blackbird	3
			brown-headed cowbird	2
			chestnut-collared longspur	4
			horned lark	3
			killdeer	3
			lark bunting	6
			loggerhead shrike	1
			marbled godwit	4
			northern harrier	2
			red-winged blackbird	11
			upland sandpiper	4
			western meadowlark	3
			willet	2
			Wilson's phalarope	8
			yellow-headed blackbird	1
		Incidental	mallard	
Tullock Creek	6/9/2003	Survey	American crow	1
			American robin	1
			bank swallow	1
			common grackle	2
			common nighthawk	1
			eastern kingbird	4
			European starling	4
			house wren	2
			killdeer	1
			lark sparrow	1
			mallard	8
			mourning dove	3
			northern flicker	1
			northern rough-winged swallow	2

			red-winged blackbird	5
			ring-necked pheasant	6
			rock dove	2
			tree swallow	3
			western kingbird	4
			western meadowlark	5
			western wood-pewee	1
			wild turkey	1
			yellow warbler	4
		Incidental	American goldfinch	
			Bullock's oriole	
			great blue heron	
			lark sparrow	
			spotted towhee	
			violet-green swallow	
			wood duck	
U All Creek	6/25/2003	Survey	bank swallow	2
			cliff swallow	1
			grasshopper sparrow	2
			horned lark	16
			killdeer	2
			mourning dove	2
			red-winged blackbird	1
			savannah sparrow	1
			western kingbird	3
			western meadowlark	17
West Blacktail Creek	6/10/2003	Survey	American kestrel	1
			American robin	1
			Brewer's blackbird	7
			brown-headed cowbird	2
			Canada goose	1
			common grackle	1
			eastern kingbird	3
			European starling	15
			gadwall	5
			killdeer	2
			lark bunting	6
			loggerhead shrike	2
			mourning dove	8
			northern flicker	1
			northern shoveler	1
			red-winged blackbird	1
			warbling vireo	1
			western meadowlark	6
			yellow-headed blackbird	2
		Incidental	American green-winged teal	
			American kestrel	
			American wigeon	
			Brewer's blackbird	

			common nighthawk	
			European starling	
			gadwall	
			loggerhead shrike	
			northern shoveler	
			prairie falcon	
			upland sandpiper	
			western wood-pewee	
			Wilson's phalarope	
West Charlie Creek	6/18/2002	Survey	American wigeon	2
			belted kingfisher	1
			blue-winged teal	1
			Brewer's blackbird	1
			brown-headed cowbird	1
			common nighthawk	1
			common snipe	3
			golden eagle	1
			lark bunting	11
			mourning dove	6
			northern shoveler	1
			red-winged blackbird	5
			ring-necked pheasant	2
			rock dove	2
			spotted sandpiper	4
			unknown blackbird	1
			upland sandpiper	2
			western meadowlark	5
		Incidental	American white pelican	
			barn swallow	
			gadwall	
			killdeer	
			mallard	
			marbled godwit	
			sharp-tailed grouse	
Whitney Creek	6/12/2004	Survey	American kestrel	1
			American robin	1
			brown-headed cowbird	2
			common grackle	2
			eastern kingbird	4
			killdeer	1
			lark sparrow	1
			mourning dove	4
			northern flicker	5
			red-tailed hawk	1
			ring-necked pheasant	2
			western kingbird	1
			western meadowlark	13
			yellow warbler	5
			yellow-rumped warbler	1

Wild Horse Creek	5/26/2003	Survey	American goldfinch	4
			American kestrel	2
			bank swallow	5
			brown-headed cowbird	5
			Canada goose	2
			eastern kingbird	2
			European starling	4
			gadwall	1
			lark bunting	2
			loggerhead shrike	3
			mallard	1
			marbled godwit	3
			mourning dove	4
			red-winged blackbird	8
			ring-necked pheasant	4
			unknown gull	1
			western kingbird	1
			western meadowlark	5
			yellow warbler	4
Willow Creek (Musselshell)	6/24/2003	Survey	Incidental American wigeon	
			black-billed magpie	
			Bullock's oriole	
			clay-colored sparrow	
			European starling	
			grasshopper sparrow	
			gray catbird	
			spotted towhee	
			American robin	5
			Brewer's blackbird	3
			brown-headed cowbird	4
			cliff swallow	1
			golden eagle	1
			gray catbird	2
			horned lark	2
			lazuli bunting	2
			long-billed curlew	1
			mallard	1
			mourning dove	1
Wolf Creek	6/2/2004	Survey	red-winged blackbird	13
			spotted sandpiper	1
			western meadowlark	2
			yellow warbler	1
			Incidental American robin	
			killdeer	
			vesper sparrow	
			western meadowlark	
			American crow	1
			American kestrel	1
			American robin	1

			brown-headed cowbird	1
			Bullock's oriole	3
			cliff swallow	125
			common grackle	9
			eastern kingbird	2
			European starling	1
			lark sparrow	1
			mountain bluebird	1
			Say's phoebe	1
			western meadowlark	3
			western wood-pewee	1
			yellow-breasted chat	2
			yellow-rumped warbler	2
		Incidental	black-billed magpie	
			eastern kingbird	
			mourning dove	
			red-winged blackbird	
			song sparrow	
			yellow warbler	
Woody Island Coulee	5/31/2004	Survey	blue-winged teal	2
			brown-headed cowbird	4
			Canada goose	16
			gadwall	6
			horned lark	2
			killdeer	7
			lark bunting	2
			marbled godwit	2
			northern pintail	2
			northern shoveler	4
			redhead	1
			ring-billed gull	1
			sora	1
			western meadowlark	4
			willet	1
			Wilson's phalarope	10
			yellow-headed blackbird	8
		Incidental	blue-winged teal	
			gadwall	
			horned lark	
			northern shoveler	
Grand Total				7,687



Table 5. Mammals captured during 2002-2004.

Site	Date set	Species	Number captured
Assiniboine Creek	7/12/2002	Peromyscus sp.	2
	9/27/2002	Peromyscus sp.	5
	7/11/2003	Peromyscus sp.	3
	9/17/2003	Peromyscus sp.	15
	7/12/2004	Peromyscus sp.	4
	9/15/2004	Peromyscus sp.	7
Big Dry Creek	9/3/2002	northern grasshopper mouse	1
		Peromyscus sp.	9
Big Porcupine Creek	7/21/2004	Peromyscus sp.	11
Bitter Creek	9/17/2002	Peromyscus sp.	7
Black Coulee (Marias)	8/25/2003	Peromyscus sp.	7
Blood Creek	9/1/2002	Peromyscus sp.	10
Boxelder Creek	7/23/2002	Peromyscus sp.	27
Brazil Creek	8/9/2004	Peromyscus sp.	2
Buggy Creek	7/18/2002	meadow vole	1
		Peromyscus sp.	20
Cabin Creek	7/27/2003	Peromyscus sp.	15
Calf Creek	8/6/2004	Peromyscus sp.	6
Cameron Creek	8/5/2003	Peromyscus sp.	11
Canyon Creek	9/10/2004	long-tailed vole	1
		Peromyscus sp.	13
Cherry Creek	8/12/2004	Peromyscus sp.	3
Chip Creek	8/18/2003	Peromyscus sp.	12
Chouteau Coulee	8/6/2002	Peromyscus sp.	10

Cottonwood Coulee	8/22/2003	Peromyscus sp.	4
Cottonwood Creek (Big Muddy)	9/5/2003	house mouse	1
		Peromyscus sp.	5
Cottonwood Creek (Frenchman)	8/21/2003	Peromyscus sp.	3
Cottonwood Creek (Marias)	8/1/2002	Peromyscus sp.	22
Crooked Creek	8/7/2004	Peromyscus sp.	14
Crow Creek (Powder)	9/15/2002	Peromyscus sp.	8
Crow Creek (Rock)	7/17/2002	Peromyscus sp.	4
	9/28/2002	Peromyscus sp.	4
	7/10/2003	Peromyscus sp.	1
	9/18/2003	Peromyscus sp.	7
	9/16/2004	Peromyscus sp.	3
Currant Creek	8/28/2002	Peromyscus sp.	8
Deep Creek	8/20/2004	Peromyscus sp.	16
Dog Creek	7/11/2002	Peromyscus sp.	14
	9/29/2002	Peromyscus sp.	13
	7/14/2003	Peromyscus sp.	12
	9/19/2003	Peromyscus sp.	24
	7/13/2004	Peromyscus sp.	2
	9/17/2004	Peromyscus sp.	15
Dry Creek	7/29/2003	Peromyscus sp.	7
Dry Fork Marias	8/23/2004	Peromyscus sp.	7
Duck Creek (Big Sandy)	8/24/2003	Peromyscus sp.	14
Duck Creek (Redwater)	9/8/2003	Peromyscus sp.	2

Eagle Creek (Bullwhacker-Dog)	9/3/2004	Peromyscus sp.	3
		prairie vole	1
Eagle Creek (Willow)	8/2/2002	northern grasshopper mouse	1
		Peromyscus sp.	8
East Fork Battle Creek	9/4/2004	Peromyscus sp.	6
East Fork Fox Creek	9/4/2003	Peromyscus sp.	5
East Fork Little Porcupine Creek	9/6/2003	Peromyscus sp.	16
East Fork Little Powder	9/16/2002	meadow vole	1
		Peromyscus sp.	6
East Pryor Creek	7/27/2004	Peromyscus sp.	7
East Redwater	8/11/2004	meadow vole	1
		Peromyscus sp.	4
		thirteen-lined ground squirrel	1
Elk Creek	8/30/2002	Peromyscus sp.	26
Flat Creek (Beaver)	8/31/2002	northern grasshopper mouse	1
		Peromyscus sp.	17
Flat Creek (Judith)	8/19/2004	Peromyscus sp.	1
Fly Creek	9/5/2002	Peromyscus sp.	10
		western harvest mouse	1
Fogarty Coulee	8/19/2003	Peromyscus sp.	5
Fords Creek	9/2/2002	house mouse	1
		Peromyscus sp.	10
		western harvest mouse	2
Foster Creek	9/15/2002	Peromyscus sp.	3
Hay Coulee	8/5/2002	northern grasshopper mouse	2
		Peromyscus sp.	10
Lake Creek	8/24/2003	Peromyscus sp.	7
Little Cottonwood Creek	7/12/2003	Peromyscus sp.	6
Little Dry Creek	9/8/2004	Ord's kangaroo rat	2

		Peromyscus sp.	1
Little Pumpkin Creek	7/24/2003	Peromyscus sp.	2
Little Sage Creek	8/3/2002	Peromyscus sp.	18
Little Warm Creek	8/8/2004	Peromyscus sp.	3
Lodge Creek	8/25/2004	Peromyscus sp.	4
Lodge Grass Creek	7/25/2004	house mouse	1
		meadow vole	1
		Peromyscus sp.	10
Lost Creek	8/12/2003	Peromyscus sp.	7
McDonald Creek	8/5/2004	Peromyscus sp.	15
Muddy Creek	7/31/2002	Peromyscus sp.	17
Murray Coulee	8/7/2002	Richardson's ground squirrel	1
Ninemile Coulee	8/4/2002	Peromyscus sp.	7
North Fork Burns Creek	7/25/2002	Peromyscus sp.	5
North Fork Willow Creek	7/22/2003	Peromyscus sp.	16
North Sunday Creek	9/3/2003	Peromyscus sp.	39
North Willow Creek	8/29/2002	Peromyscus sp.	15
O'Brien Coulee	8/24/2004	Peromyscus sp.	13
Owl Creek	8/11/2003	Peromyscus sp.	8
Pine Creek	7/28/2003	Peromyscus sp.	6
		prairie vole	1
Pole Creek	7/14/2004	northern grasshopper mouse	2
		Peromyscus sp.	8
Police Creek	7/20/2002	meadow vole	1
		Peromyscus sp.	1
Prairie Elk Creek	8/10/2004	Ord's kangaroo rat	1
		Peromyscus sp.	5
Pryor Creek	7/28/2004	house mouse	1

		Peromyscus sp.	2
Rattlesnake Creek	9/9/2004	Peromyscus sp.	35
Rotten Grass Creek	7/26/2004	Peromyscus sp.	11
Sage Creek	8/23/2003	house mouse	1
		Peromyscus sp.	24
Sand Creek	7/23/2003	Peromyscus sp.	2
	9/6/2004	Peromyscus sp.	8
Sarpy Creek	7/23/2004	Peromyscus sp.	1
Sheep Creek	8/13/2004	Peromyscus sp.	16
Shonkin Creek	8/21/2004	Peromyscus sp.	5
Sixshooter Creek	8/14/2003	northern grasshopper mouse	1
		Peromyscus sp.	5
Snow Coulee	7/19/2002	meadow vole	1
		Peromyscus sp.	8
South Cottonwood Creek	7/26/2003	Peromyscus sp.	20
South Fork Lisk Creek	9/7/2003	Peromyscus sp.	10
South Sunday Creek	9/4/2002	Peromyscus sp.	8
Sprague Creek	7/21/2003	Peromyscus sp.	2
Steve's Fork	7/5/2002	olive-backed pocket mouse	1
		Peromyscus sp.	2
	9/25/2002	Peromyscus sp.	3
	7/9/2003	Peromyscus sp.	7
	9/16/2003	Peromyscus sp.	7
	7/10/2004	meadow vole	1
		Peromyscus sp.	2
		prairie vole	1
	9/14/2004	Peromyscus sp.	3
Telegraph Creek	7/13/2003	Peromyscus sp.	24

Thompson Creek (Little Dry)	7/10/2002	Peromyscus sp.	7
	9/26/2002	Peromyscus sp.	7
	7/8/2003	Peromyscus sp.	12
	9/15/2003	Peromyscus sp.	13
	7/9/2004	Peromyscus sp.	3
Thompson Creek (Little Missouri)	7/24/2004	meadow vole	1
		Peromyscus sp.	33
Timber Creek	7/25/2003	Peromyscus sp.	7
	9/7/2004	Peromyscus sp.	5
Trail Creek	8/10/2003	Peromyscus sp.	4
	8/22/2004	Peromyscus sp.	10
Tule Creek	7/22/2002	meadow vole	1
		Peromyscus sp.	4
Tullock Creek	8/9/2003	Peromyscus sp.	1
West Blacktail Creek	8/7/2003	Peromyscus sp.	23
West Charlie Creek	7/24/2002	Peromyscus sp.	10
Whitney Creek	7/29/2004	Peromyscus sp.	1
Wild Horse Creek	8/20/2003	Peromyscus sp.	18
Willow Creek	8/6/2003	Peromyscus sp.	3
Wolf Creek	7/15/2004	Peromyscus sp.	6
Woody Island Coulee	9/5/2004	Peromyscus sp.	9
Grand Total			1,174

## **Chapter 2. Spatiotemporal Variation of Fish Assemblages in Montana Prairie Streams**

### **Introduction**

Information on spatiotemporal variation of prairie fish assemblages is necessary to develop a greater understanding of fish assemblages in Montana prairie streams. Prior surveys have defined the distribution of fish species in Montana prairie streams; however, we lack information on how fish assemblages vary spatially and temporally within prairie streams because most of these surveys were single visits to a single site on each stream during summer. This study focuses on spatiotemporal variability of prairie fish assemblages in a subset of Montana prairie streams, which will help place the overall prairie fish database into context. Our study design will provide insight into spatial trends and temporal variation of prairie fish assemblages within and across drainages. We will also determine the extent of spatial and temporal use of prairie streams by main river fish. By studying five streams across a gradient of size we will be able to assess relationships between drainage size and the fish assemblage. Native prairie fishes will benefit from more informed management and conservation decisions by addressing the information gap on the spatiotemporal dynamics of prairie stream fishes. Our findings will indicate where, when, and how often to sample prairie streams for the purposes of determining species richness, composition, and trend monitoring. This information will be useful to fisheries managers who need to know where, when, how many, and which fish species occur in streams in their region. We will also begin to reveal links between large river ecosystems and prairie streams, which is vital information for those charged with managing and preserving large river fishes. This study will not only provide a better understanding of prairie fishes and their ecosystems, but will also provide guidance for day-to-day management, such as how human disturbances (e.g., culverts and streambed alteration projects) can be managed to minimize deleterious effects.

## Study Area

The study area is located in the Northwestern Great Plains region of the Yellowstone basin with the Missouri plateau, river breaks, and central grassland geological features dominating the area (Woods et al. 1999). The terrestrial ecosystem is northwestern mixed grasslands (Galat et al. 2005). Grazing and row crop agriculture dominate the land use activities. Oil extraction occurs in the Cedar and Cabin creek drainages.

The five streams are Cabin Creek, Cedar Creek, O'Fallon Creek, North Sunday Creek, and Sweeney Creek. All of the streams connect directly to Yellowstone River between the towns of Forsyth and Glendive, Montana. Our study streams are typical prairie streams; often highly turbid, with warm summer temperatures and isolated pools during low discharge.

## Methods

*Site selection.*—Longitudinal sites (N = 9-10 on each of the 5 streams; dependent on access and permission) were selected using a stratified random design for each stream. Strata were formed by dividing the main channel of each creek into 10 equal-length reaches beginning at the confluence with the Yellowstone River and extending to the headwaters (Figure 1). Longitudinal sites 1 and 9 served as the lower and upper temporal sites, respectively. The middle temporal site was established by random selection from either longitudinal site 5 or 6.

*Fishes.*—Fishes were sampled at each site by seining a 300-m reach of stream with 6.4 mm mesh seines. All fishes captured were identified to species, and lengths of at least 30 randomly selected individuals were recorded for each species. Up to ten voucher specimens for each species were preserved, and voucher specimens were examined in the laboratory to verify field identifications.

*Aquatic and riparian habitat.*—We surveyed habitat in the same location where fish were sampled following the U. S. Environmental Protection Agency protocol for physical habitat characterization (Kaufmann and Robison 1998). Habitat variables measured included measures of channel dimensions, substrate size and type, habitat complexity and cover, riparian vegetation cover and structure, and anthropogenic alterations.



*Water chemistry.*—Water conductivity ( $\mu\text{mhos/cm}$ ), dissolved oxygen ( $\text{mg/L}$ ), pH, salinity ( $\text{ppt}$ ), turbidity ( $\text{NTU}$ ), water temperature ( $^{\circ}\text{C}$ ), and air temperature ( $^{\circ}\text{C}$ ), were recorded at each site.

## Results and Discussion

*Landowner contacts and site establishment.*—A total of 33 different landowners were contacted and permission was obtained to sample fish. A friendly working relationship was established with all landowners and thank you letters were sent out in December 2005. Longitudinal sites were established and all were sampled in June 2005, July 2005, and June 2006 except for two sites on O’Fallon Creek (sites 2 and 5), which were not sampled in June 2005 due to high water. We were unable to establish four longitudinal sites due to a lack of access or permission. A total of 15 temporal sites (3 on each of the 5 streams) were established and all were sampled in June, July, August, and October 2005, and April and June 2006 (Table 1). Thermographs, set to record water temperature every 6 hours, were installed at each temporal site in May 2005.

*General fish summary.*—Fish were present at 165 of 181 samples (91.2%). A total of 55,620 individual fishes of 25 species were captured (Table 3, total fish abundance differs due to juvenile *Hybognathus* missing from the table). Nineteen taxa and 51,787 individual fishes were native and the remaining six species and 3,833 individual fishes were non-native. We captured main river guild fishes including channel catfish, emerald shiner, flathead chub, goldeye, river carpsucker, shorthead redhorse, smallmouth buffalo, and western silvery minnow.

Fathead minnow were the most commonly occurring species; overall they were collected from 43 of the 46 unique sites (93.5%). Plains minnow were the next most common species, collected from 31 of the 46 sites (67.4%). Plains killifish were collected from 28 of the 46 sites (60.9%). White sucker, sand shiner, and green sunfish were detected at approximately half the sites, while the remaining 19 species were collected from less than half of the sites. Brook stickleback, emerald shiner, goldeye, longnose sucker, smallmouth buffalo, and yellow perch were detected at less than 10% of the 46 unique sites.

*Longitudinal.*—In general, there was a decrease in species richness moving from the confluence toward the headwaters for all streams (Figure 2). Preliminary examination suggests larger

streams support greater species richness at greater distances upstream, before a distinct decline in species richness appears. The smaller streams in this study show a marked decline in species richness lower in the drainage. However, this decline may be confounded with anthropogenic connectivity issues. For example, there are at least partial barriers in Cedar Creek and Sweeney Creek and the abrupt decline in species richness occurs above these locations.

Fishes in the main river guild declined more sharply from downstream to upstream sites, and often were rare or absent from the middle temporal sites and higher in the drainage (Figure 2). Species richness of main river fish appears to be positively related to drainage size as the greatest species richness at the sites lowest in the drainage ( $N = 7$  species) occurred in O’Fallon Creek (greatest watershed size), while the smallest value of species richness ( $N = 2$  species) occurred in Sweeney Creek (smallest watershed size). The absence of any main river species above Site 3 in Cedar Creek and Sweeney Creek further suggests a barrier effect.

The upper reaches often support species which are rare or absent throughout the remainder of the stream. Brook stickleback were present only in the upper two sites of O’Fallon Creek. Brassy minnow were largely limited to the upper half of O’Fallon Creek. Fathead minnow and green sunfish were often common in upper reaches of all streams and present at low levels or absent in the middle and lower reaches.

*Temporal.*—Our assessment of temporal variation of fish assemblages is unfinished at this point because we are not finished with temporal sampling. However, preliminary evaluation of the temporal variation in species richness within sites suggests more stability at upper sites than lower sites (Figure 3). Species richness varied from 9 to 16 in lower O’Fallon Creek. The high species richness values in June 2005, October 2005, and June 2006 in O’Fallon Creek were likely associated with high flow events, which may have “re-stocked” the potential species pool. Similarly, species richness was highest in October 2005 in lower Cabin Creek, perhaps due to stream flow prior to sampling.

Species richness of main river guild fishes decreased from lower to upper sites (Figure 4). O’Fallon Creek had higher levels of species richness in June and October compared to July and August of 2005, possibly due to the flow events acting as an attractant to main river fish in the Yellowstone River. Interestingly, the lower Cabin Creek site had a constant species richness

value of 3 in June, July, and August 2005, before an increase to 4 in October 2005 (western silvery minnow). Similarly, one western silvery minnow was caught on Cedar Creek in June, zero in July and August, and 107 individuals were caught in October 2005. The increase in presence of western silvery minnow could again be the result of a flow event occurring in autumn, which acted as an attractant or alternatively the recruitment of juveniles to the sampling gear.

*Species richness.*—Our preliminary analysis has focused on species richness to gain a general understanding of spatiotemporal variation of fish assemblages. However, this is an incomplete representation of the fish assemblage because species richness does not account for species composition and abundance. For example, three main river species were present in the lower site of Cedar Creek in August and October 2005 (Figure 4). However, the fish species present in August were channel catfish, flathead chub, and river carpsucker, while the species present in October were flathead chub, river carpsucker and western silvery minnow. Assessing species richness alone does not capture the interesting information that western silvery minnow moved into the site and channel catfish left the site between August and October. Future assessments will evaluate spatiotemporal variation of fish assemblages not only in terms of species richness, but also in terms of species composition by employing a multivariate approach to evaluate the assemblage structure.

#### Plans for 2006, 2007

Temporal sites will be sampled in July, August, and October 2006, and January and April 2007. This will complete a two-year period of sampling with at least one sample per season (except possibly winter, due to frozen streams). Sampling of longitudinal sites will be repeated in July 2006. Further analysis will assess spatiotemporal variation of species composition, and assemblage structure in relation to longitudinal position, season, watershed size, and reach-scale habitat variables.

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Table 1.—Work schedule for the seasonal and longitudinal sampling of the spatiotemporal prairie fish project.

Year	Month	Longitudinal Samples	Temporal Samples
2005	June	x	x
	July	x	x
	August		x
	October		x
2006	January		x
	April		x
	June	x	x
	July	x	x
	August		x
	October		x
2007	January		x
	April		x

Table 2.—Site locations for five Montana prairie streams. Sites are abbreviated by the first two letters of the stream, the number represents position in the drainage (1-lowest to 10-highest), and letters indicate the site serves as a temporal site (A-lower, B-middle, C-upper).

Stream	Site	HUC	Latitude	Longitude
O'Fallon	OF1A	10100005	46.81676	105.14857
	OF2	10100005	46.73830	105.08101
	OF3	10100005	46.68116	104.97356
	OF4	10100005	46.54478	104.83237
	OF5	10100005	46.46606	104.75743
	OF6B	10100005	46.44203	104.75623
	OF7	10100005	46.30962	104.76370
	OF9C	10100005	46.10468	104.74969
	OF10	10100005	46.05182	104.79012
North Sunday	NS1A	10100001	46.49097	105.78212
	NS2	10100001	46.47141	105.83847
	NS3	10100001	46.45564	105.90954
	NS4	10100001	46.47675	105.93221
	NS5	10100001	46.52691	106.00868
	NS6B	10100001	46.55384	106.00863
	NS7	10100001	46.60155	106.10889
	NS8	10100001	46.67052	106.16468
	NS9C	10100001	46.72346	106.24438
	NS10	10100001	46.77116	106.32650
Cabin	CA1A	10100004	46.91118	104.86131
	CA3	10100004	46.80269	104.81576
	CA4	10100004	46.77330	104.78348
	CA5B	10100004	46.72696	104.72138
	CA6	10100004	46.69566	104.66110
	CA7	10100004	46.68621	104.59106
	CA8	10100004	46.65099	104.46658
	CA9C	10100004	46.62666	104.42926
	CA10	10100004	46.55330	104.35271
Cedar	CE1A	10100004	46.95575	104.78360
	CE2	10100004	46.92765	104.74120
	CE3	10100004	46.90394	104.70809
	CE4	10100004	46.88742	104.66805
	CE5B	10100004	46.83597	104.59270
	CE6	10100004	46.83062	104.58775
	CE7	10100004	46.78935	104.55449
	CE9C	10100004	46.76092	104.45921
	CE10	10100004	46.77024	104.42181
Sweeney	SW1A	10100001	46.26427	106.32732

SW2	10100001	46.25491	106.32664
SW3	10100001	46.23500	106.32803
SW4	10100001	46.23083	106.33176
SW5B	10100001	46.19838	106.31174
SW6	10100001	46.19102	106.30596
SW8	10100001	46.15088	106.26561
SW9C	10100001	46.13861	106.26059
SW10	10100001	46.11970	106.24535

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Table 3.—Fishes captured in five tributaries of the lower Yellowstone River, June 2005 to June 2006. Streams are organized by watershed size from largest to smallest, reading from left to right.

	Stream					
<b>Family</b>						
Common name, <i>Genus species</i>	O'Fallon	North Sunday	Cabin	Cedar	Sweeney	Abundance
<b>Hiodontidae</b>						
goldeye, <i>Hiodon alosoides</i>	X	X				8
<b>Cyprinidae</b>						
lake chub, <i>Couesius plumbeus</i>	X	X	X	X		2,154
common carp, <i>Cyprinus carpio</i>	X	X	X	X	X	160
western silvery minnow, <i>Hybognathus argyritis</i>	X	X	X	X	X	552
brassy minnow, <i>Hybognathus hankinsoni</i>	X					961
plains minnow, <i>Hybognathus placitus</i>	X	X	X	X	X	4,675
emerald shiner, <i>Notropis atherinoides</i>	X					9
sand shiner, <i>Notropis stramineus</i>	X	X	X	X	X	4,146
fathead minnow, <i>Pimephales promelas</i>	X	X	X	X	X	20,495
flathead chub, <i>Platygobio gracilis</i>	X	X	X	X	X	3,714
longnose dace, <i>Rhinichthys cataractae</i>	X	X	X	X	X	732
creek chub, <i>Semotilus atromaculatus</i>	X		X	X	X	911
<b>Catostomidae</b>						
river carpsucker, <i>Carpionodes carpio</i>	X	X	X	X		1,332
longnose sucker, <i>Catostomus catostomus</i>		X			X	4
white sucker, <i>Catostomus commersonii</i>	X		X		X	1,497
smallmouth buffalo, <i>Ictiobus bubalus</i>	X					1
shorthead redhorse, <i>Maxostoma macrolepidotum</i>	X		X		X	41
<b>Ictaluridae</b>						
black bullhead, <i>Ameiurus melas</i>	X	X	X	X	X	618
yellow bullhead, <i>Ameiurus natalis</i>						1
channel catfish, <i>Ictalurus punctatus</i>	X	X	X	X	X	747
stonecat, <i>Noturus flavus</i>	X	X	X	X	X	106
<b>Cyprinodontidae</b>						
plains killifish, <i>Fundulus zebrinus</i>	X	X	X	X	X	859
<b>Gasterosteidae</b>						
brook stickleback, <i>Culaea inconstans</i>	X					332
<b>Centrarchidae</b>						
green sunfish, <i>Lepomis cyanellus</i>	X	X	X		X	2,190
<b>Percidae</b>						
yellow perch, <i>Perca flavescens</i>	X					5
Total						46,250



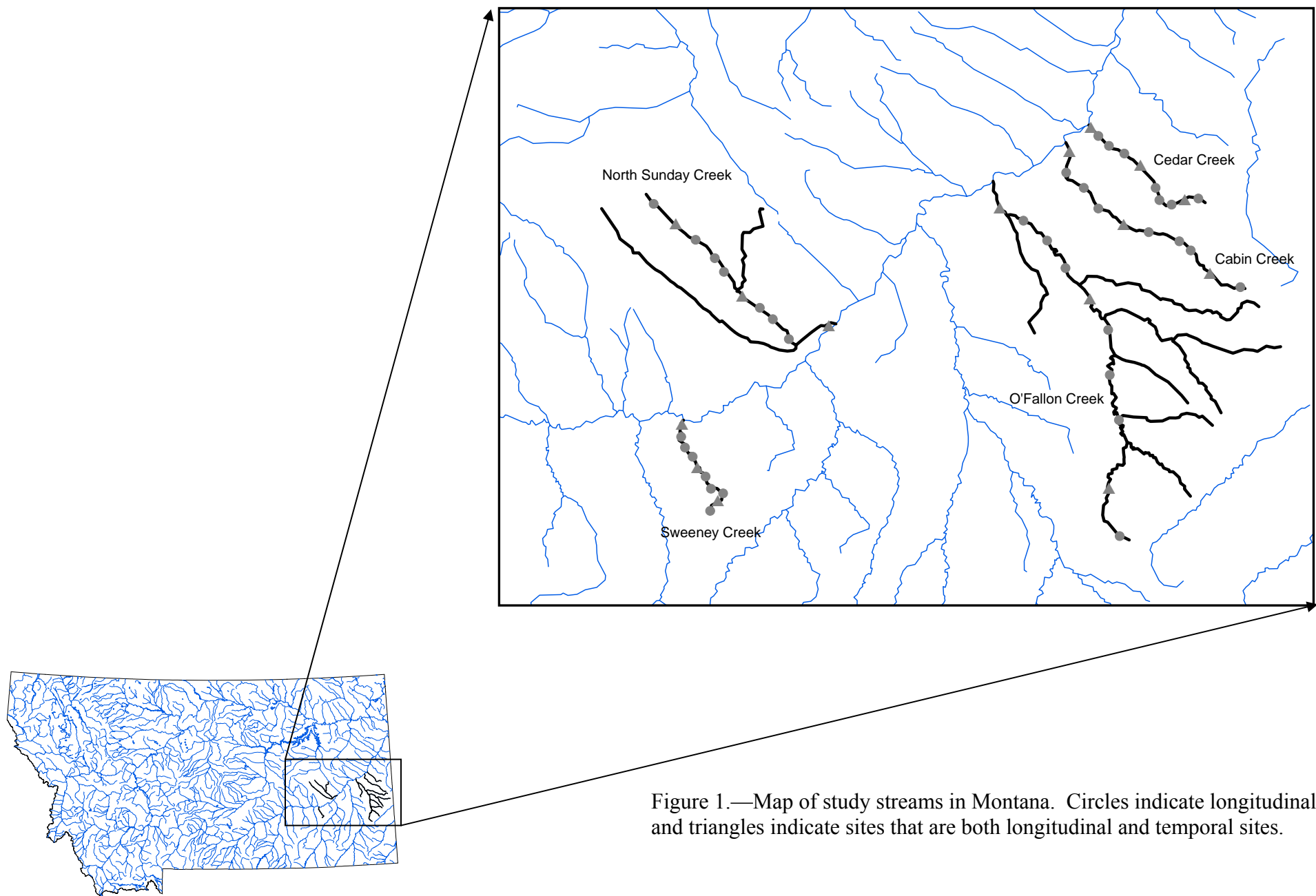


Figure 1.—Map of study streams in Montana. Circles indicate longitudinal sites and triangles indicate sites that are both longitudinal and temporal sites.

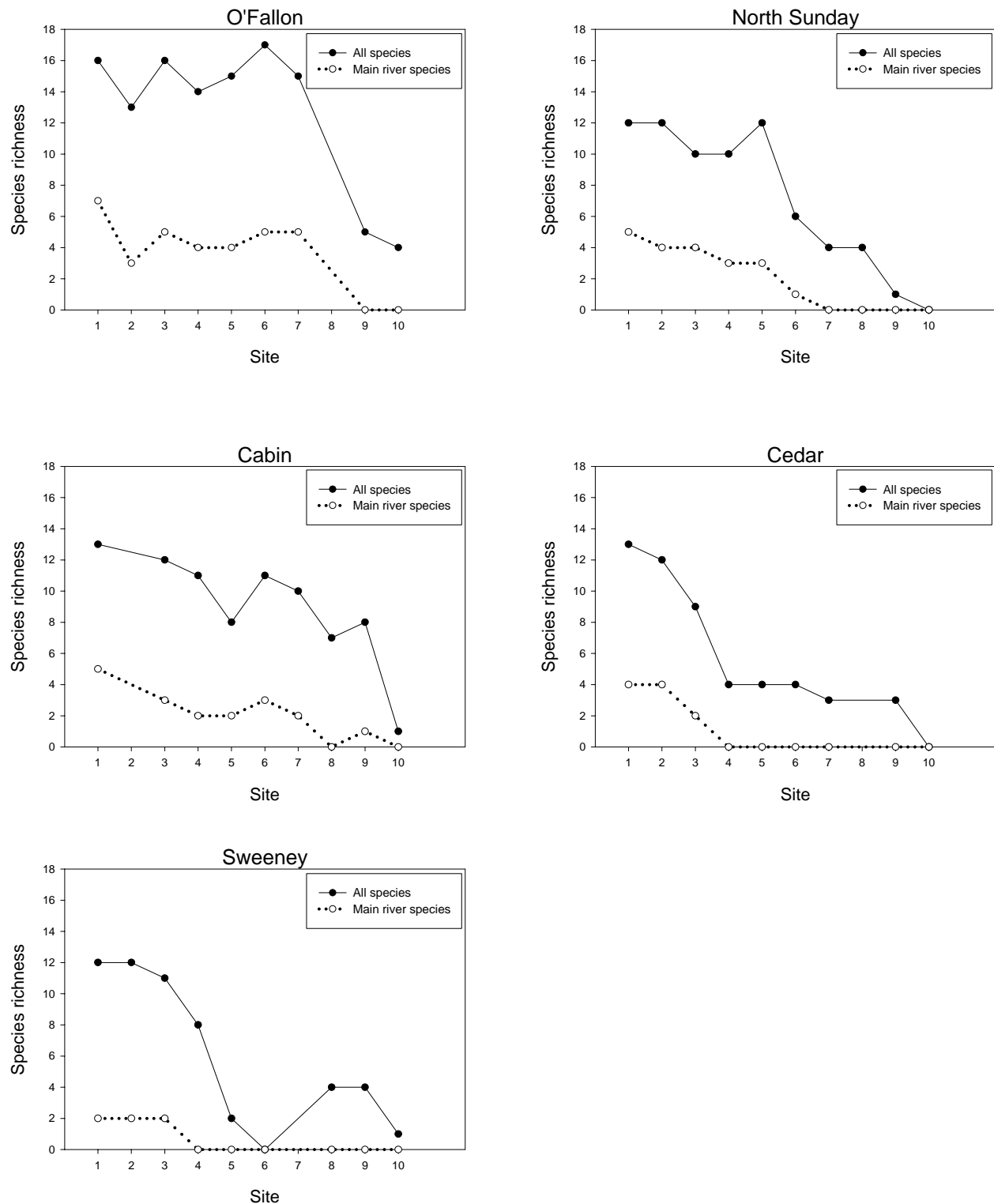


Figure 2.—Cumulative species richness of fishes collected in June 2005, July 2005, and June 2006 from five tributaries of the lower Yellowstone River. Streams are organized from largest to smallest, reading from left to right. Sites 1 through 10 represent longitudinal sites from the confluence to headwaters and sites not sampled are indicated by an absent circle. Main river guild fishes are listed in the text.

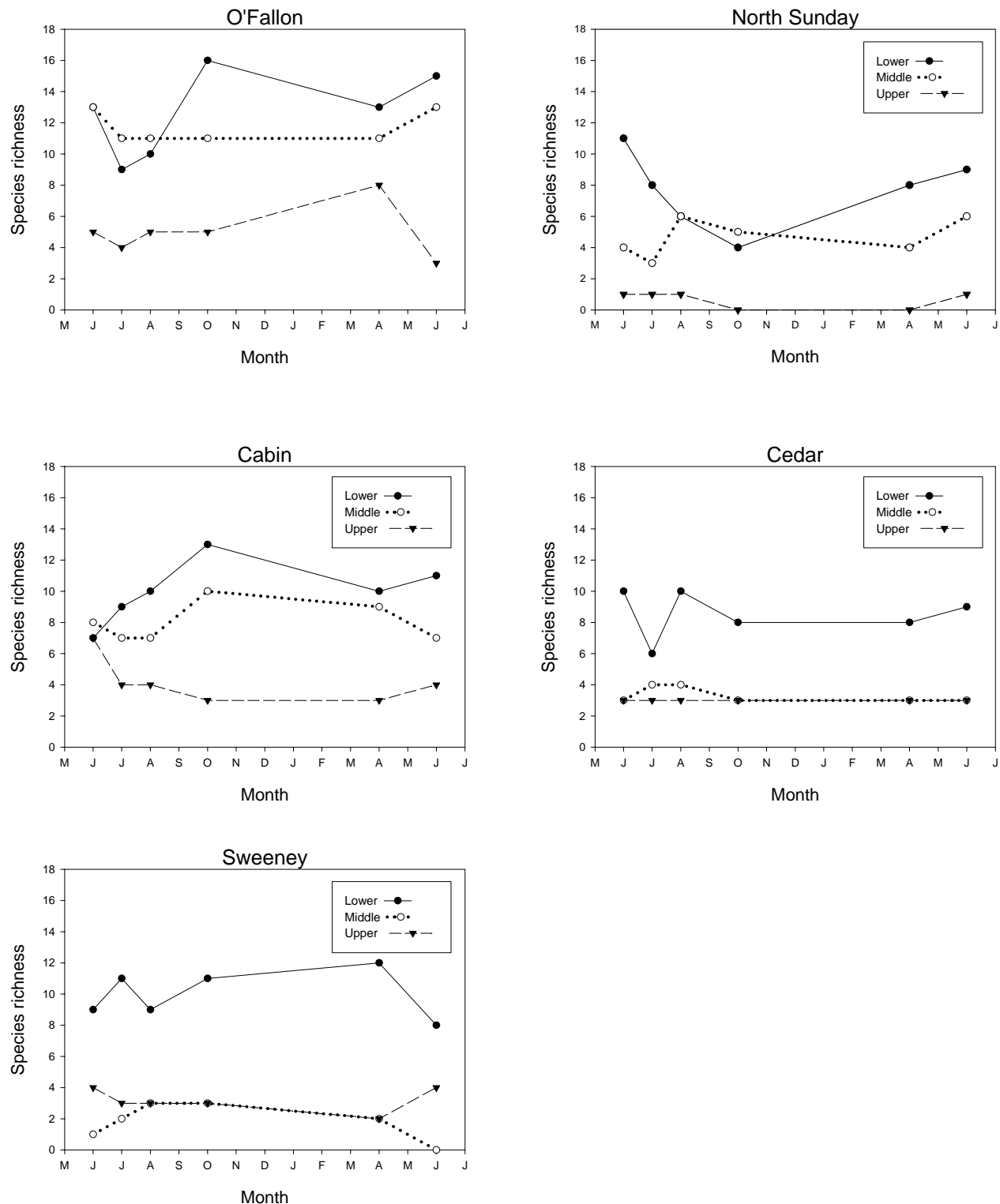


Figure 3.—Species richness of fishes collected in June, July, August, and October 2005, and April and June 2006 from five tributaries of the lower Yellowstone River. Streams are organized from largest to smallest, reading from left to right. Lower, middle, and upper sites are designated by solid circles, open circles, and solid triangles, respectively.

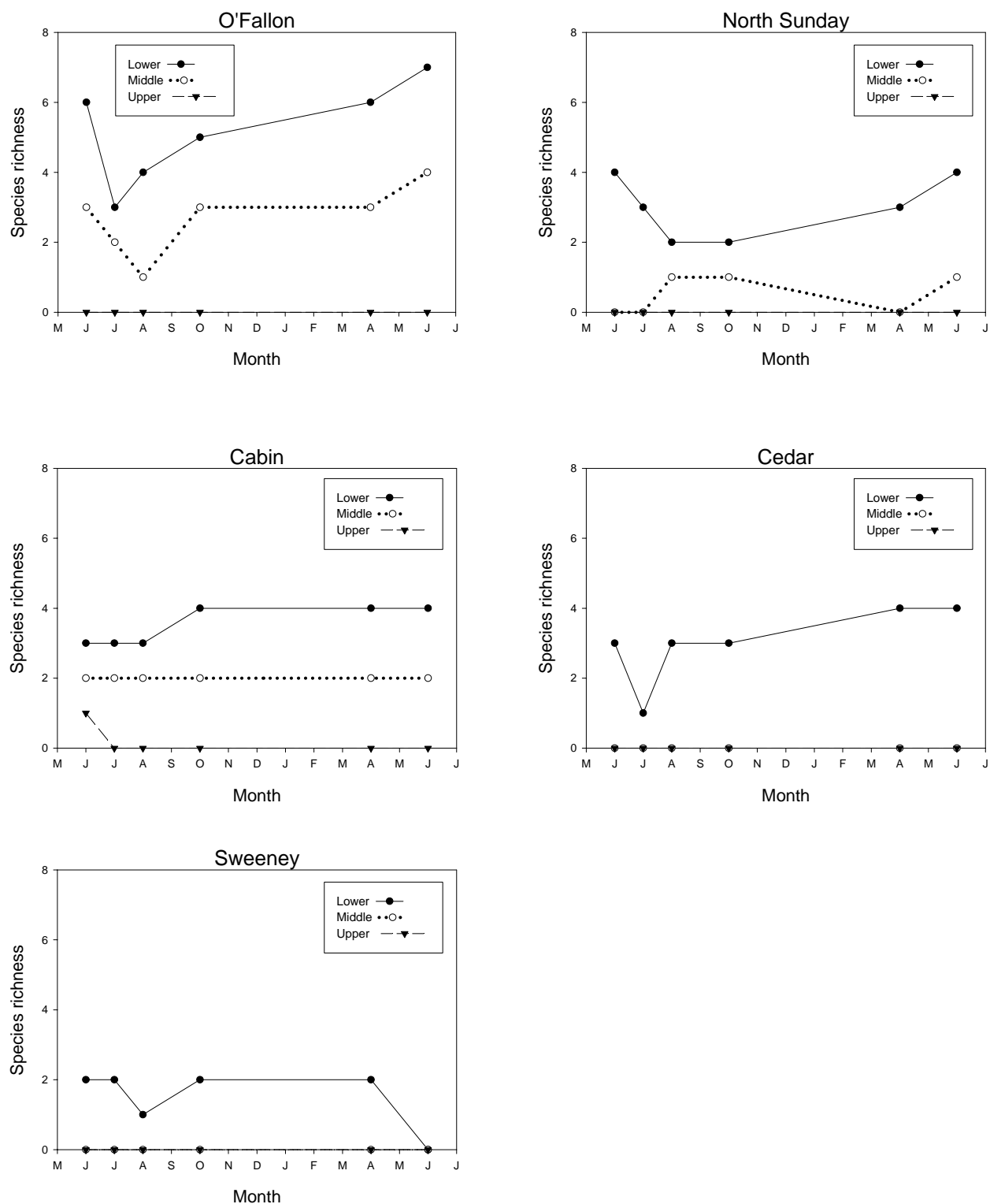


Figure 4.—Species richness of main river fishes collected in June, July, August, and October 2005, and April and June 2006 from five tributaries of the lower Yellowstone River. Streams are organized from largest to smallest, reading from left to right. Main river guild fishes are listed in the text.